TM 11-5011

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

SIGNAL RADIO SHOP

RADIO RECEIVER R-206A/PR

DEPARTMENT OF THE ARMY • DECEMBER 1949

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Figure 1. Radio Receiver R–206A/PR.

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

This technical manual contains instructions for the installation, operation, maintenance, and repair of Radio Receiver R–206A/PR (fig. 1). In addition to these instructions there are two appendixes covering a list of references and an identification table of parts.

2. Forms and Records

The forms listed below are used in reporting receipt, operation, and maintenance of the equipment. Use other forms and records as authorized.

NME Form 6, Report of Damaged or Improper Shipment.

DA AGO Form 468, Unsatisfactory Equipment Report.

AF Form 54, Unsatisfactory Report.

a. NME Form 6 (Report of Damaged or Improper Shipment) for Equipment Used by the Army. NME Form 6 will be filled out and forwarded in accordance with AR 700–30 or AFR 67–5, when equipment is received in a damaged condition or when it is necessary to report unsatisfactory preservation, packaging, packing, marking, loading, unloading, and handling of supplies.

b. DA AGO Form 468 (Unsatisfactory Equipment Report) for Equipment Used by the Army. DA AGO Form 468 will be filled out and forwarded through channels to the Office of the Chief Signal Officer, Washington 25, D. C., when trouble occurs more often than is normal, as determined by qualified repair personnel.

c. AF Form 54 (Unsatisfactory Report) for Equipment Used by the Air Force. AF Form 54 will be filled out and forwarded to Commanding General, Air Matériel Command, Wright-Patterson Air Force Base, Dayton, Ohio, in accordance with AF Regulation 15–54.

Section II. DESCRIPTION AND DATA

3. Use and Capability

Radio Receiver R–206A/PR (fig. 1) is a portable a-m (amplitude-modulated) communications receiver which covers three tuning ranges (195 to 410 kc (kilocycles), 540 to 1,560 kc, and 2,200 to 6,200 kc) in three bands. It is designed to operate from a 105- to 125-volt, 50- to 60-cycle a-c (alternating-current) power source, from a 105- to 125-volt d-c (direct-current) power source, or from self-contained dry batteries. A collapsible whip antenna (fig. 2) may be used on all three bands, or a self-contained loop antenna (fig. 4) may be used on the two lower-frequency bands, 1 and 2. Either the built-in speaker or a headset may be used for listening; a panel-mounted jack is provided for a headset. A panel-mounted meter jack (fig. 2) provides a means of taking field-strength measurements. With an appropriate meter plugged into the jack (par. 12*f*), the receiver may be used to check the A-N signals of a radio range.

4. Table of Components

a. The dimensions and weight of the equipment constituting Radio Receiver R–206A/PR are shown in the following table:

Component	Height (in.)	Depth (in.)	Length (in.)	Weight (lb.)
Radio Receiver R–206A/PR, complete with tubes, less batteries.	8½	6½	12	9¾
Whip antenna	128¾ (extended); 17⅜ (collapsed)			¾

Note. This list is for general information only. See appropriate publications for information pertaining to the requisition of spare parts.

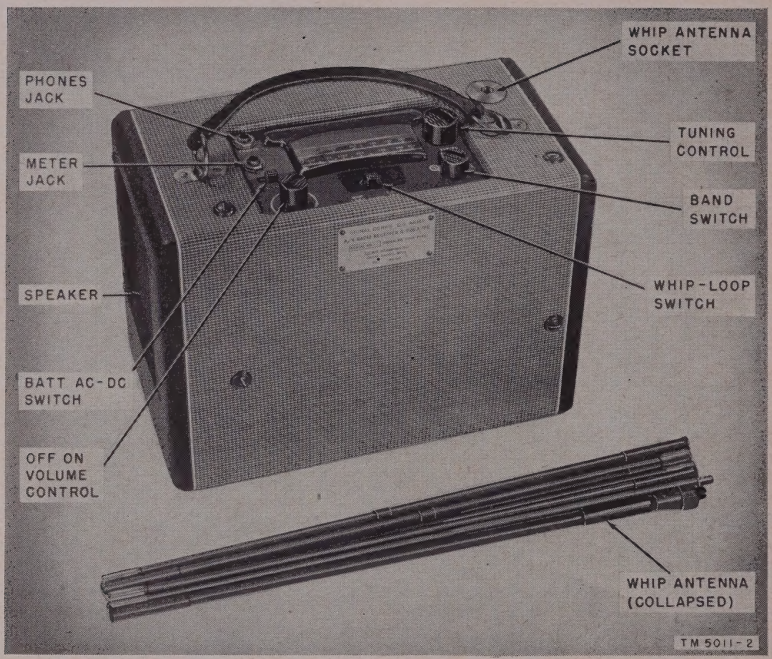


Figure 2. Radio Receiver R–206A/PR, front view.

b. The physical characteristics of the equipment, the panel lay-out, and the location and accessibility of components within the cabinet are shown in figures 1, 2, 4, 5, and 6.

5. Performance Characteristics

Below are outlined the technical and performance characteristics of Radio Receiver R–206/PR.

Frequency range	Band No. 1: 195–410 kc. Band No. 2: 540–1,560 kc. Band No. 3: 2,200–6,200 kc.
Receiver type	Superheterodyne.
Types of signals which can be received.	A2—Modulated telergaphy (a-m tone). A3—Telephony (a-m voice).
Number of tubes	7.
Tube complement	Type 1N5GT R-f (radio-frequency) amplifier. Type 1A7GT Converter. Type 1N5GT I-f (intermediate-frequency) amplifier. Type 1H5GT Detector—a-f (audio-frequency) amplifier. Type 1A5GT Power amplifier (battery operation). Type 50B5 Power amplifier (a-c—d-c operation). Type 35W4 Rectifier (a-c—d-c operation).
Intermediate frequency	455 kc.
Antenna	Whip: Bands No. 1, 2, and 3. Loop: Bands No. 1 and 2 only.
Sensitivity (for 50 mw (milliwatts) output on a-c operation).	Whip: Band No. 1: 20 microvolts. Band No. 2: 15 microvolts. Band No. 3: 15 microvolts. Loop: Band No. 1: 100 microvolts per meter. Band No. 2: 200 microvolts per meter.
Power input	20 watts (ac or dc).
Power output	50 mw on battery operation. 0.5 watts on a-c or d-c operation.
Power supply requirements	A-c: 105- to 125-volt, 50/60 cycle. D-c: 105- to 125-volt. Battery: One 7½-volt A (Ray-O-Vac P–85–A or equal). Two 45-volt B (Battery BA–63).

6. Packaging Data for Export Shipment

Radio Receiver R–206A/PR is shipped in one case, as shown in figure 3. The dimensions, weight, and volume of the packaged equipment are shown in the following table:

Note. Items may be packaged in a manner different from that shown, depending on supply channel.

Component	Number of packages	Dimensions			Weight (lb)	Volume (cu ft)
		Height (in.)	Depth (in.)	Length (in.)		
Radio Receiver R–206A/PR, complete with tubes, less batteries, with whip antenna.	1	16½	10½	22½	21½ (approx)	2¼

7. Differences in Models

Radio Receiver R–206A/PR is similar in function and operation to Radio Receiver R–206/PR (Lear model RM–402B) as modified per MWO SIG 11–5011–1. An identification table of parts and a schematic diagram for the modified receiver (fig. 24) are included in this manual.

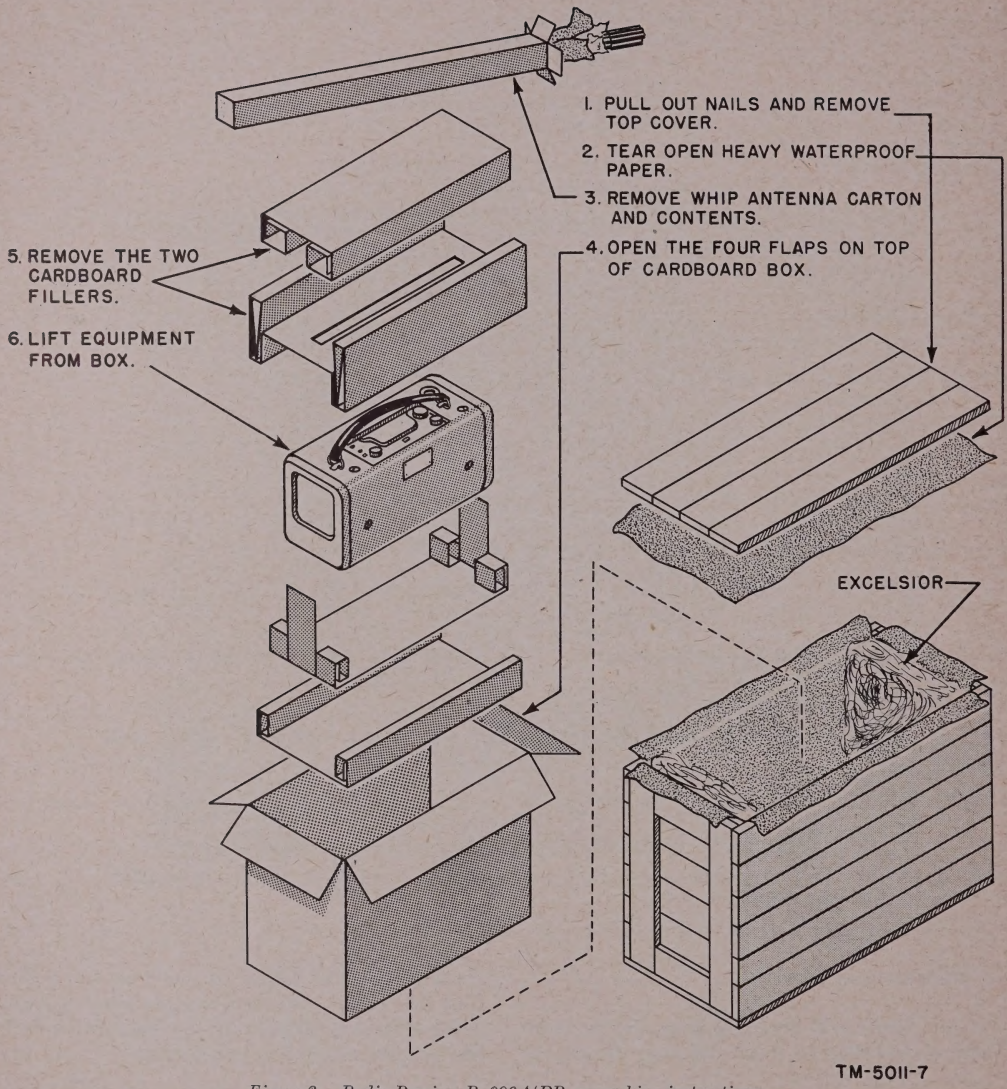

1. PULL OUT NAILS AND REMOVE TOP COVER.
2. TEAR OPEN HEAVY WATERPROOF PAPER.
3. REMOVE WHIP ANTENNA CARTON AND CONTENTS.
4. OPEN THE FOUR FLAPS ON TOP OF CARDBOARD BOX.
5. REMOVE THE TWO CARDBOARD FILLERS.
6. LIFT EQUIPMENT FROM BOX.
EXCELSIOR
TM-5011-7

Figure 3. Radio Receiver R–206A/PR, unpacking instructions.

CHAPTER 2
OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

8. Service Necessary for New Equipment

a. Uncrating, Unpacking, and Checking. Be extremely careful when unpacking or handling the equipment because it may be damaged easily when not protected by the packing case. Do not apply pressure to the dial cover face. In unpacking the receiver, refer to figure 3 and follow the steps outlined below:

(1) Remove the nails with a nail puller, and remove the top of the packing case (fig. 3). *Prying off the top may result in damage to the equipment.*

(2) Tear open the protective wrappings.

(3) Remove the cardboard cartons containing the whip antenna and the receiver.

(4) After removing the equipment from the packing case, inspect it visually for damage, and check the components against the master packing slip.

Note. Save the original packing cases and containers for both export and domestic shipments. They can be used again when the equipment is repacked for storage or shipment.

b. Battery Installation and Tube Testing. ***Caution:*** Be sure the receiver is turned off (VOLUME control turned completely counterclockwise).

(1) Remove the four screws which secure the back of the carrying case; remove the back (fig. 8).

(2) Remove the loop antenna and swing it to one side as shown in figure 4. The loop may be disconnected entirely by loosening the screw-type terminal board connections behind the loop (fig. 8).

(3) Remove the tubes (par. 24*e*) and test them in a reliable tube checker. After checking the tubes return them to their proper sockets; replace any defective tubes. Correct tube layout is shown in figure 20.

(4) Place the batteries in the case as shown in figure 20, replace the loop antenna, and secure the back of the case with the four screws.

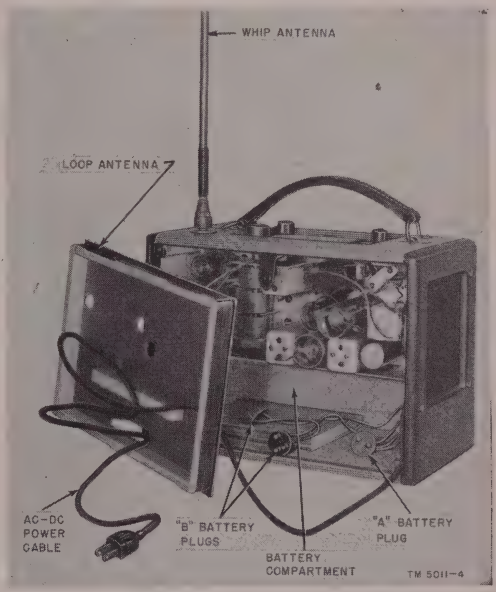


Figure 4. Radio Receiver R–206A/PR, interior view.

c. Whip Antenna Installation.

(1) Extend the collapsible whip antenna so that each section will telescope properly at joining sections.

(2) Screw the base of the whip into the antenna socket on top of the receiver unit. Turn clockwise until tight.

9. Service Necessary for Used Equipment

The instructions and precautions for used and/or reconditioned equipment are the same as for new equipment.

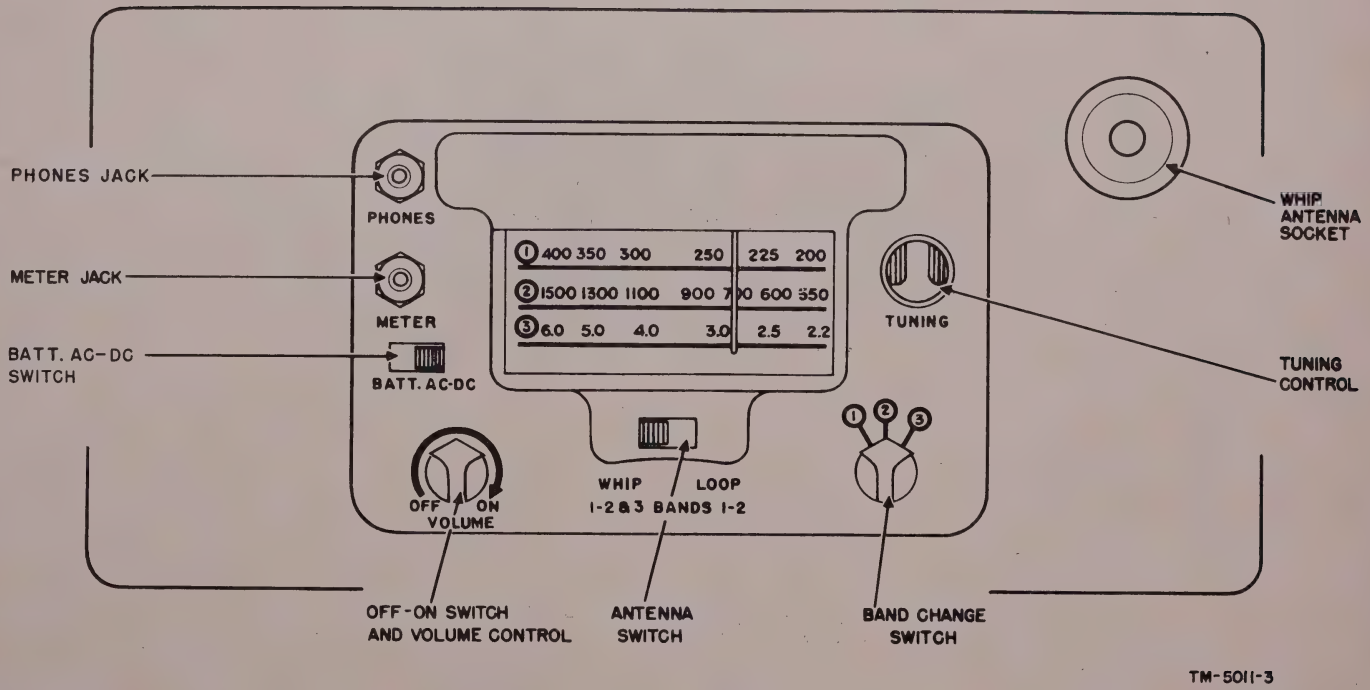


Figure 5. Radio Receiver R–206A/PR, control panel.

Section II. CONTROLS AND INSTRUMENTS

10. Description and Purpose of Controls (fig. 5)

a. Batt. AC-DC Switch. The BATT. AC-DC switch, located on the left side of the control panel, selects the source of power from which the receiver is to be operated. For battery operation, snap the switch to the left. For either a-c or d-c operation, snap the switch to the right.

b. Band Switch. The band switch, located in the front right-hand corner of the control panel, selects band 1, 2, or 3 (195 to 410 kc, 540 to 1,560 kc or 2,200 to 6,200 kc, respectively).

c. Tuning Control. The TUNING control, located in the back right-hand corner of the control panel, is used for tuning the receiver to any frequency within the band selected by the band switch.

d. Off-On-Volume Control. The OFF-ON-VOLUME control, located in the front left-hand corner of the control panel, is used to turn the receiver on and off and to control the gain of the receiver.

e. Whip-Loop Switch. The WHIP-LOOP switch, located in the front center of the control panel, is used to connect either the whip antenna or the self-contained loop antenna to the receiver input circuit.

f. Phones Jack. The PHONES jack is located in the back left-hand corner of the control panel and may be used for connecting a headset by means of a standard Plug PL–55. When a headset is plugged in, the built-in speaker is disconnected automatically from the circuit.

g. Meter Jack. The METER jack is located directly in front of the headset jack and may be used for connecting a signal-strength indicating meter by means of a standard Plug PL–55.

h. Whip Antenna Socket. A threaded socket for connection of the whip antenna is located to the right and toward the back of the control panel.

Section III. OPERATION

11. Starting

a. Connecting to A-C or D-C Power Source. If the receiver is to be operated on ac or dc, open the hinged door on back of the cabinet (fig. 6) and pull out the attachment cord. Plug the cord into an outlet for 105- to 125-volt dc or 105- to 125-volt, 50/60 cycle ac.

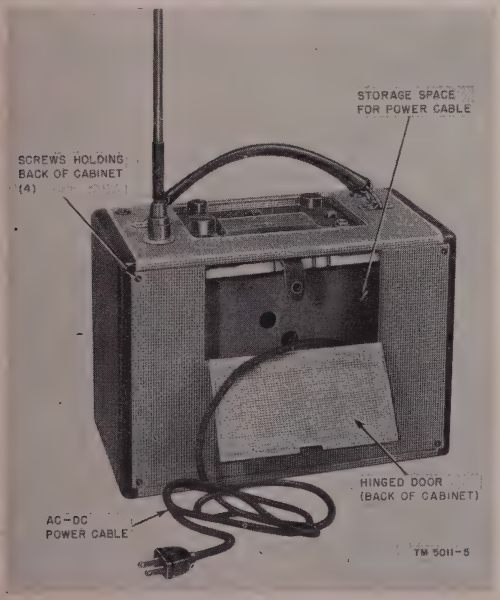


Figure 6. Radio Receiver R–206A/PR, rear view.

b. Connecting Whip Antenna. Extend the collapsible whip antenna so that all sections are joined properly. Place the whip in the antenna socket and turn it clockwise until it is tight.

c. Selecting Power Source. If the receiver is to be used on a-c or d-c power, slide the BATT. AC-DC switch to the AC-DC (right-hand) position. If the receiver is to be used on the self-contained battery supply, slide the BATT. AC-DC switch to the BATT. (left-hand) position.

d. Applying Power. Turn the OFF-ON-VOLUME clockwise until a click is heard.

12. Receiving

a. Selecting Frequency Range. Turn the band switch to position 1, 2, or 3 for operation between 195 and 410 kc, 540 and 1,560 kc, or 2,200 and 6,200 kc, respectively.

b. Selecting Antenna. Slide the antenna switch to the WHIP (left-hand) position for operation with the whip antenna on any of the three bands. Slide the switch to the LOOP (right-hand) position for operation with the loop antenna on band No. 1 or 2.

c. Selecting Exact Frequency. Turn the TUNING control until the dial pointer is at the

approximate position for the desired station. Turn the VOLUME control clockwise until reception is heard and readjust the TUNING control, if necessary, for clear reception; set the VOLUME control for a comfortable listening level.

Note. If the receiver is being operated on d-c and reception is not obtained within 1 minute after turning on the OFF-ON switch, reverse the attachment cord plug in the power outlet.

d. Headset Reception. Insert the plug on the headset cord into the PHONES jack located in the back left-hand corner of the control panel. When the headset is connected, reception cannot be heard over the built-in loudspeaker.

e. Loop Antenna Directional Effect. If the receiver is being operated with the antenna switch in the LOOP (right-hand) position, a directional effect will be noted on practically all stations being received. For best results when tuned to any particular station, the receiver should be lifted by the carrying handle and turned slowly, first in one direction and then in the other, until the signal is loudest.

f. Signal-Strength Indication with Meter. Radio Receiver R–206A/PR may be used for measuring field intensities by plugging an indicating meter into the METER jack located directly in front of the PHONES jack. The meter should be a rectifier type a-c voltmeter with a 0- to 5-volt range.

13. Stopping

a. OFF–ON Switch. Turn the OFF-ON-VOLUME control counterclockwise until a click indicates that the power switch is turned off.

b. Disconnecting Whip Antenna. Disconnect the whip antenna by turning it counterclockwise in the socket. After it has been disconnected, collapse it by successively disjoining each section; begin at the tip section.

c. Disconnecting from A-C or D-C Power. Unplug the attachment cord from the power outlet and push the cord back into the cabinet. Close the hinged door.

14. Arctic Operation

When Radio Receiver R–206A/PR is operated on dry-cell batteries at low temperatures, it should, if possible, be allowed to stand with power off in a heated shelter prior to operation. For additional precautions, refer to paragraph 36 of JB SIG 66.

CHAPTER 3
ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. PREVENTIVE MAINTENANCE

15. Definition of Preventive Maintenance

PM (preventive maintenance) is work performed on equipment (usually when the equipment is not in use) to keep it in good working order so that break-downs and needless interruptions in service will be kept to a minimum. PM differs from trouble-shooting and repair since its object is to prevent certain troubles from occurring. Refer to TM 38–650.

16. Tools and Materials Required

Only the hand tools and materials normally available in the repair kit of organizational maintenance personnel are required for PM operation; for example, in Tool Equipment TE–41.

17. General Preventive Maintenance Techniques

a. Use No. 0000 sandpaper to remove corrosion.

b. Use a clean, dry, lint-free cloth or a dry brush for cleaning. When necessary, moisten the cloth or brush with Solvent, dry-cleaning (SD) and wipe the parts dry with a cloth. However, do not use solvent (SD) for cleaning electrical contacts; use carbon tetrachloride.

c. If available, dry compressed air may be used at a line pressure not exceeding 60 pounds per square inch to remove dust from inaccessible places; be careful, however, or mechanical damage may result from the air blast.

d. For further information on PM techniques, refer to TB SIG 178.

18. Performing Preventive Maintenance

The following checklist is a summary of the PM operations to be performed on Radio Receiver R–206A/PR. The time intervals shown on the checklist may be reduced at any time by the local commander. For best operation of the equipment, perform the services at least as frequently as called for in the checklist.

Item No.	Operation	Item	Before operation	After operation	Daily	Weekly	Monthly
1	Clean	Exterior of receiver			X		
2	Inspect	Battery plug-in connections (fig. 4). Be sure plugs are seated firmly.	X		X		
3	Test	Battery voltages. Replace weak batteries (par. 8*b*).	X	X			
4	Tighten	Whip antenna connection	X				
5	Clean	Headset and cable plug (not supplied)	X			X	
6	Inspect	Control knobs (fig. 5). Tighten loose knobs. Be sure band switch is in correct position.	X			X	
7	do	Loop antenna connections (fig. 8). Tighten loose connections.	X			X	
8	do	Tubes. All tubes must be seated firmly in sockets, and all grid cap connections must be in position (fig. 7).	X			X	
9	Clean	Indicating meter and plug (not supplied)	X			X	

Item No.	Operation	Item	Before operation	After operation	Daily	Weekly	Monthly
10	Inspect	Whip antenna. Check for proper joining of all sections.	X			X	
11	do	A-c—d-c power cable. Check for worn insulation or exposed wires in cable.	X			X	
12	Test	Dial pointer. Check for correct movement when turning TUNING knob.	X			X	
13	Clean	Interior of receiver. (See par. 25 for instructions on removing chassis.)					X
14	Inspect	Chassis wiring and connections					X

Section II. LUBRICATION AND WEATHERPROOFING

19. Lubrication

For preservative purpose, apply a thin film of Oil, lubricating, preservative, (PL-SPECIAL) U. S. Army Spec 2–120, to all external metallic surfaces. Lubrication of internal parts of Radio Receiver R–206A/PR is not required, and the use of lubricants may prove harmful to the proper functioning of the equipment

20. Weatherproofing

a. Tropical Operation. Radio Receiver R–206A/PR is protected against deterioration under tropical climatic conditions by a moistureproofing and fungiproofing varnish treatment applied at the time of manufacture. For re-treatment, refer to TB SIG 13.

b. Desert Operation. To prevent failure of Radio Receiver R–206A/PR because of infiltration of dust or dirt, take the precautions outlined in TB SIG 75.

c. Arctic Operation. Radio Receiver R–206A/PR will perform satisfactorily under low-temperature conditions. Note the precautions listed in paragraph 14.

Section III. TROUBLE SHOOTING AT ORGANIZATIONAL MAINTENANCE LEVEL

21. Scope

The trouble-shooting and repair work that can be performed at the organizational maintenance level (operators and repairmen) is necessarily limited in scope by the tools, test equipment, and replaceable parts issued and by the existing tactical situation. Accordingly, trouble shooting is based on the performance of the equipment and the use of the senses in determining such troubles as burned-out tubes, defective wiring, etc. If organizational methods are not successful, the equipment must be turned over to field or depot maintenance personnel.

22. Visual Inspection

Failure of the equipment to operate properly usually will be caused by one or more of the faults listed below. Check the following items, combining visual inspection with an operational check (par. 23), in an effort to locate and correct the trouble.

a. Weak batteries.
b. Improperly connected battery cable.
c. Worn, broken, or disconnected line cord or plug.
d. Defective switches.
e. Defective wiring (par. 25).
f. Defective tubes (par. 24).
g. Defective components.

23. Operational Check

Refer to paragraphs 11, 12, and 13, for normal operating procedure. Operate the equipment on battery, a-c, and d-c power with first the loop and then the whip antenna in use. Check operation on each of the three bands. Check for normal output on speaker and phones, and, if possible, check for output at METER jack J–1. The following checklist enumerates some symptoms of abnormal operation, with possible causes and corrective measures. If the recommended corrective measures do not yield results, trouble shooting is necessary. Paragraphs 24 and 25 outline the procedures for checking tubes and visually inspecting the equipment. Trouble shooting at field and depot maintenance levels is incorporated in chapter 5.

Symptom	Corrective measure
Output on a-c—d-c operation only	Check tube V–5, battery output, battery plugs, BATT. AC-DC switch.
Output on battery operation only	Check line cord, BATT. AC-DC switch, and tubes V–6 and V–7; if power source is dc, reverse power plug in outlet.
No output for any mode of operation	Check tubes V–1 through V–4; check operation of OFF-ON switch; check wiring. See chapter 5.
No output on any one particular band	Check tuning circuits and switching circuits for particular band in use. See chapter 5.
No output with loop antenna in use	Check loop antenna connections (fig. 8) and loop antenna tuning and switching circuits; check loop resistance (par. 43); check wiring.
No output with whip antenna in use	Check wiring to whip and whip antenna tuning and switching circuits. See chapter 5.
No phone output or no speaker cut-out action when phones are used.	Check wiring to PHONES jack.
Phone output but no speaker output	Check wiring to PHONES jack and to speaker.
No output at METER jack J–1	Check wiring to jack J–1.

24. Locating and Replacing Defective Tubes

a. Remove the back of the cabinet and the loop antenna so that the tubes can be observed (par. 8*b* (1) and (2)).

b. Plug the line cord into an appropriate power outlet; place the BATT. AC-DC switch in the AC-DC position; and place the OFF-ON volume control in the ON position.

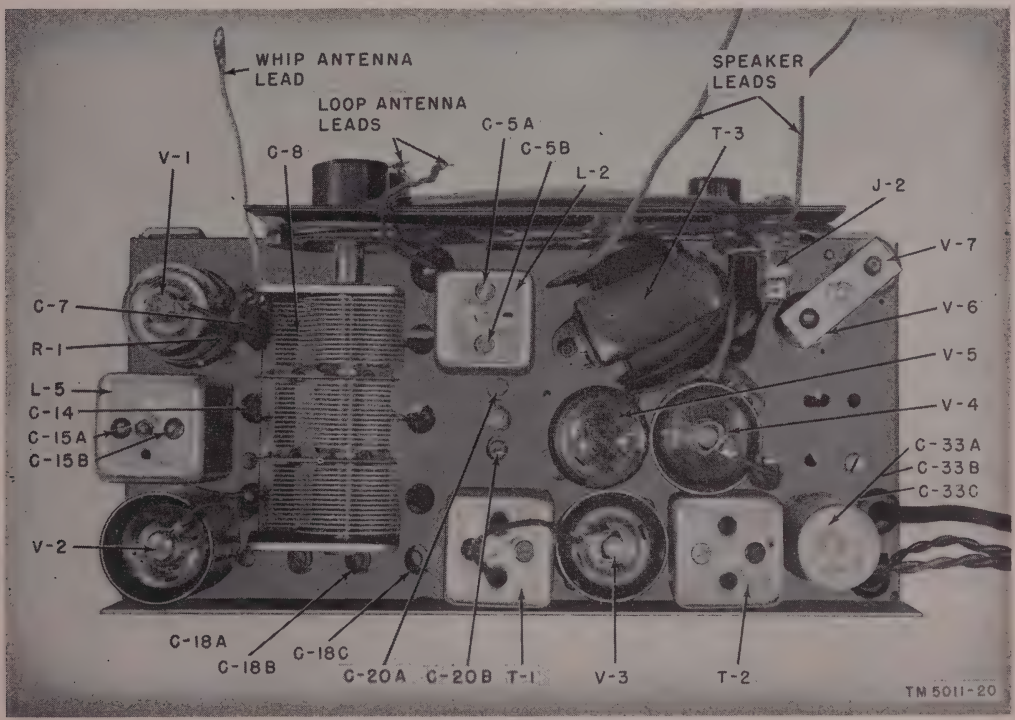
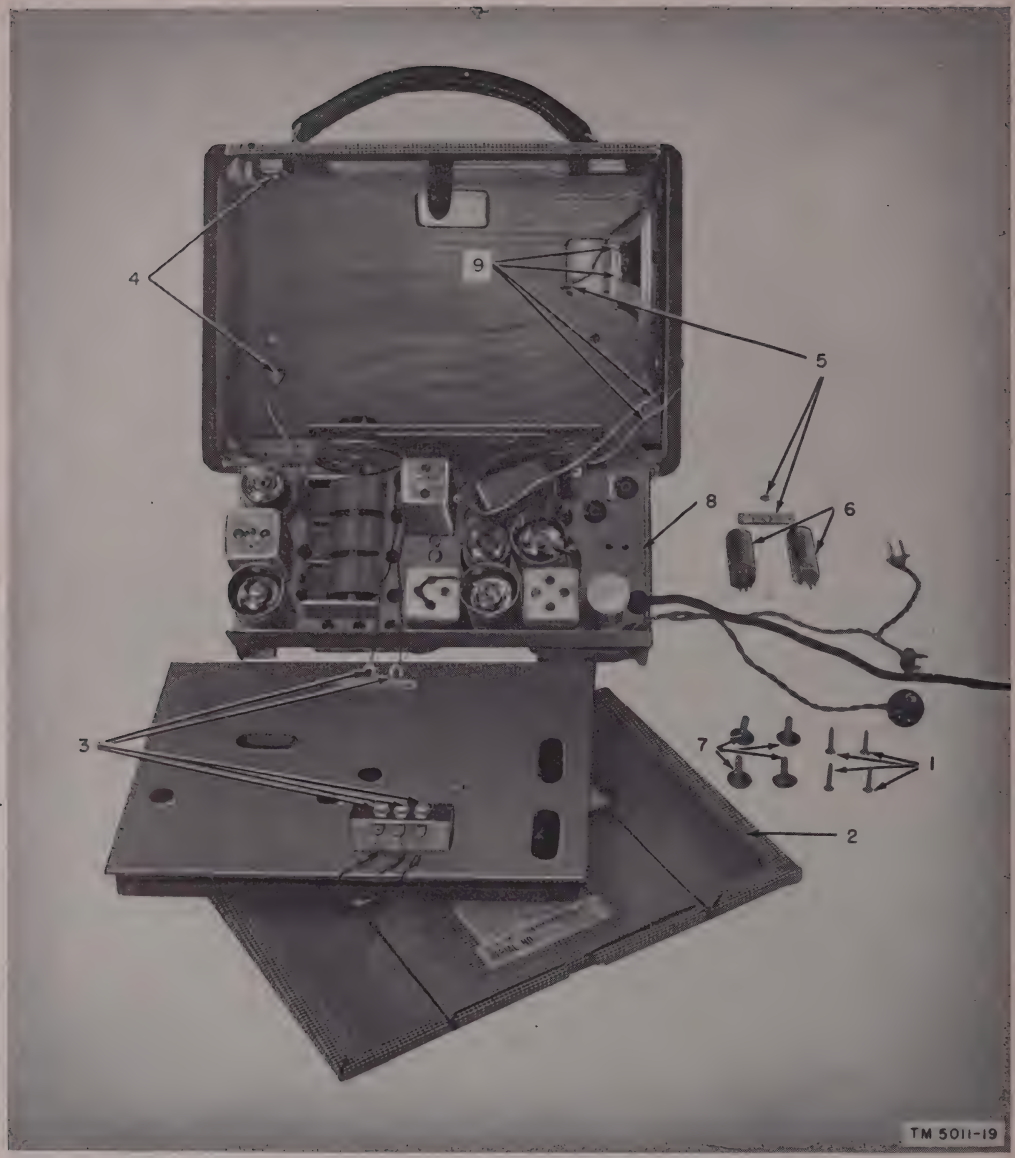


Figure 7. Radio Receiver R–206A/PR, top view of chassis.



1. Remove screws from back of case.
2. Remove back of case.
3. Disconnect loop antenna.
4. Disconnect whip antenna.
5. Remove tube clamp and speaker ground connection.
6. Remove tubes V–6 and V–7.
7. Remove chassis retaining screws from top and front of case.
8. Slide chassis out of case.
9. Unsolder speaker leads (if necessary).

Figure 8. Radio Receiver R–206A/PR, disassembly instructions.

c. The filaments of all tubes but V–5 should light. If all the tubes fail to light, V–6 or V–7 is probably defective. If V–6 or V–7 are the only tubes which light, one or more of tubes V–1 through V–4 may be defective; or, on d-c operation only, the line plug may be reversed in its socket.

d. Place the BATT. AC-DC switch in the BATT. position. Tubes V–1 through V–5 should light. If tubes V–1 through V–4 light on battery operation but not on a-c—d-c operation, tube V–6 or V–7, or some other circuit component, is probably defective. If tubes V–1 through V–4 light on a-c—d-c but not on battery operation, tube V–5 probably is defective.

e. To remove a tube, disconnect the grid cap connection (if any) and pull directly up on the tube. Do not rock or jiggle the tube in its socket if it can be extracted by a direct upward pull. Rock it gently if it does not release easily. Jiggling the tube in its socket during removal spreads the contacts. A clamping bar, to which the speaker frame is grounded, is used to secure the a-c—d-c a-f output tube (V–6) and the rectifier tube (V–7) in their sockets. Loosen the nut which secures the clamping bar before attempting removal of these tubes. Label each tube as soon as it is removed to insure replacement in the proper socket When replacing tubes, restore all original connections.

25. Removing Chassis for Inspection

To remove the chassis from the carrying case, perform the following steps:

a. Remove the four screws which secure the back of the case; remove the back.

b. Remove the loop antenna from the case and disconnect the two wires on the terminal board on the rear of the loop (fig. 8). Label the wires and the terminals to insure proper replacement.

c. Disconnect the wire leading to the whip antenna socket (fig. 8). Disconnect the wire between the speaker frame and the clamp on a-c—d-c a-f output tube V–6 and rectifier tube V–7 (fig. 8).

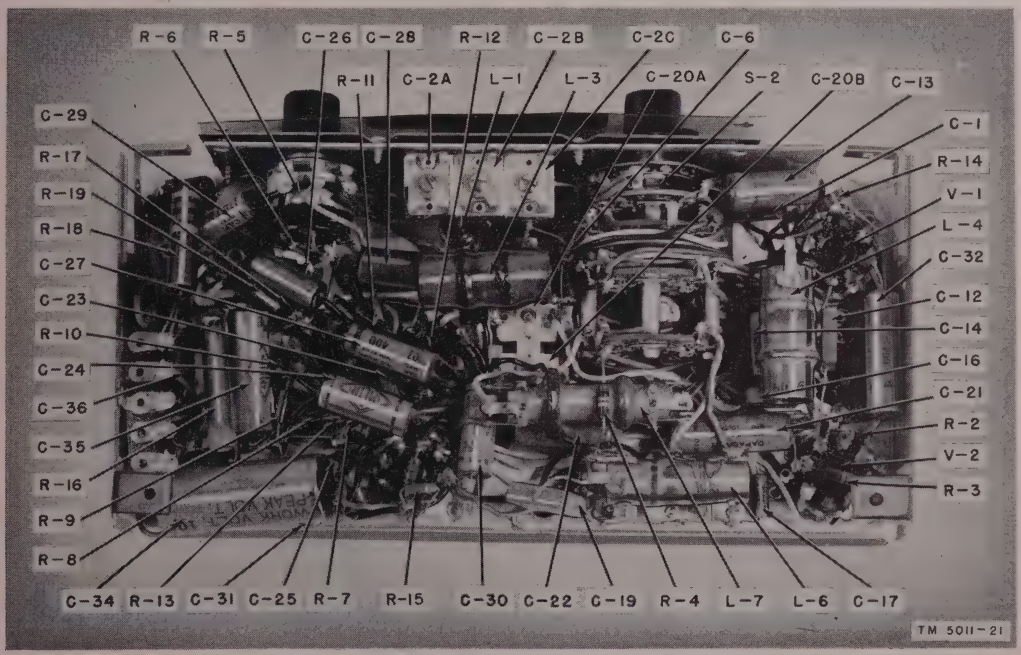


Figure 9. Radio Receiver R–206A/PR, bottom view of chassis.

d. Remove tubes V–6 and V–7 to allow clearance for the chassis.

e. While supporting the chassis, remove the two retaining screws from the top of the carrying case and the two retaining screws from the front of the carrying case. The chassis may then be taken out of the case. Avoid placing excess strain on the speaker leads which are still connected to the chassis. Unless the speaker itself is removed, or the speaker leads are unsoldered, the carrying case must be turned on its end (speaker down) to allow placement of the chassis on a bench or table; the short speaker leads limit the movement of the chassis.

f. Inspect the chassis wiring for loose or broken connections and worn or frayed insulation. Look for signs of excessive heating.

g. To replace the chassis, reverse the procedure of steps *a* through *f* above.

CHAPTER 4
THEORY OF OPERATION

Note. Refer to figure 23 for an over-all schematic diagram of the receiver.

26. Block Diagram (fig. 10)

a. Radio Receiver R–206A/PR is a portable a-m communications receiver which covers three tuning ranges (195 to 410 kc, 540 to 1,560 kc, and 2,200 to 6,200 kc) in three bands. As indicated in figure 10, a whip antenna is provided for use on all three bands, and a loop antenna is provided for alternate use on the two lower bands. A panel mounted WHIP-LOOP switch is used for selecting the desired antenna.

b. The r-f signals induced in the selected antenna are amplified by r-f stage V–1 and heterodyned in converter stage V–2 to produce a 455-kc i-f signal. After amplification in i-f stage V–3, the audio component of the signal is detected and amplified by V–4. The a-f signal is fed to a-f output stages V–5 and V–6. When the receiver is operated on battery power, V–5 is operative; when an a-c or d-c power line is the primary power source, V–6 is operative. Output from either V–5 or V–6 is coupled to loudspeaker LS–1 and to meter jack J–1. If an output meter is plugged into J–1, the receiver may be used to measure relative field intensities. A PHONES jack (J–2) also is provided on the panel for use of a headset in place of the loudspeaker.

c. Operating voltages for the receiver may be supplied by dry cell batteries or by a 105- to 125-volt a-c or d-c power source. A 7½-volt battery is used as a filament supply; a 90-volt battery is used for plate and screen requirements. When the receiver is operated from a power line, the output of rectifier stage V–7 supplies all plate and screen voltages and filament power to tubes V–1 through V–4. The power source is selected by means of a panel mounted BATT. AC-DC switch.

27. Antenna Circuits (fig. 11)

a. Loop Antenna Connection. When the receiver is operated with the loop antenna (on bands 1 and 2), WHIP-LOOP switch S–1 grounds the ship antenna (E–2) circuit and connects the loop antenna (E–1) in parallel with capacitor C–8A, one section of the three-gang main tuning capacitor. Section S–2A of band switch S–2 is used to connect trimming elements in parallel with capacitor C–8A on the different bands. When the band switch is at position 1, trimmer capacitor C–2A is connected in parallel with the loop and capacitor C–8A to allow alinement of the antenna circuits on the high end of the 195- to 410-kc band (par. 52). Position 2 of the band switch connects inductance L–1 and trimmer capacitor C–2B in parallel with C–8A; the resulting lower inductance allows for tuning over the 540, to 1,560-kc band. Capacitor C–2B is provided for alinement of the antenna circuit on the high end of this band (par. 53). The loop antenna is not intended for use on band 3.

b. Whip Antenna Connection. When WHIP-LOOP switch S–1 is placed in the WHIP position, the loop antenna is grounded and the whip antenna circuit is connected in parallel with tuning capacitor C–8A through section S–2B of the band switch (fig. 11). On each of the three bands, the whip connects through capacitor C–1 and contacts on the rear section of S–2B to a primary winding of an antenna coil (windings of L–2 on bands 1 and 2 or a winding of L–3 on band 3). Secondary windings, paralleled by trimmer capacitors, are connected in parallel with main tuning capacitor C–8A through contacts on the front section of S–2B. Capacitive as well as loose inductive coupling is used between primary and secondary windings of the antenna coils to provide uniform response over the desired range. The inductive coupling decreases as the frequency increases; the

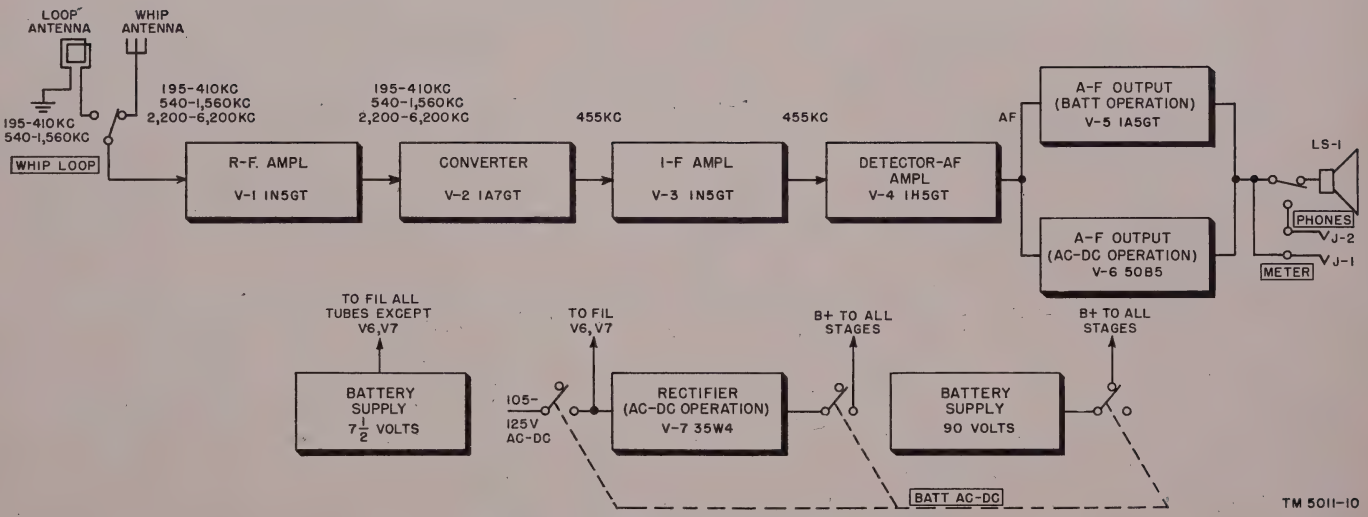


Figure 10. Radio Receiver R–206A/PR, block diagram.

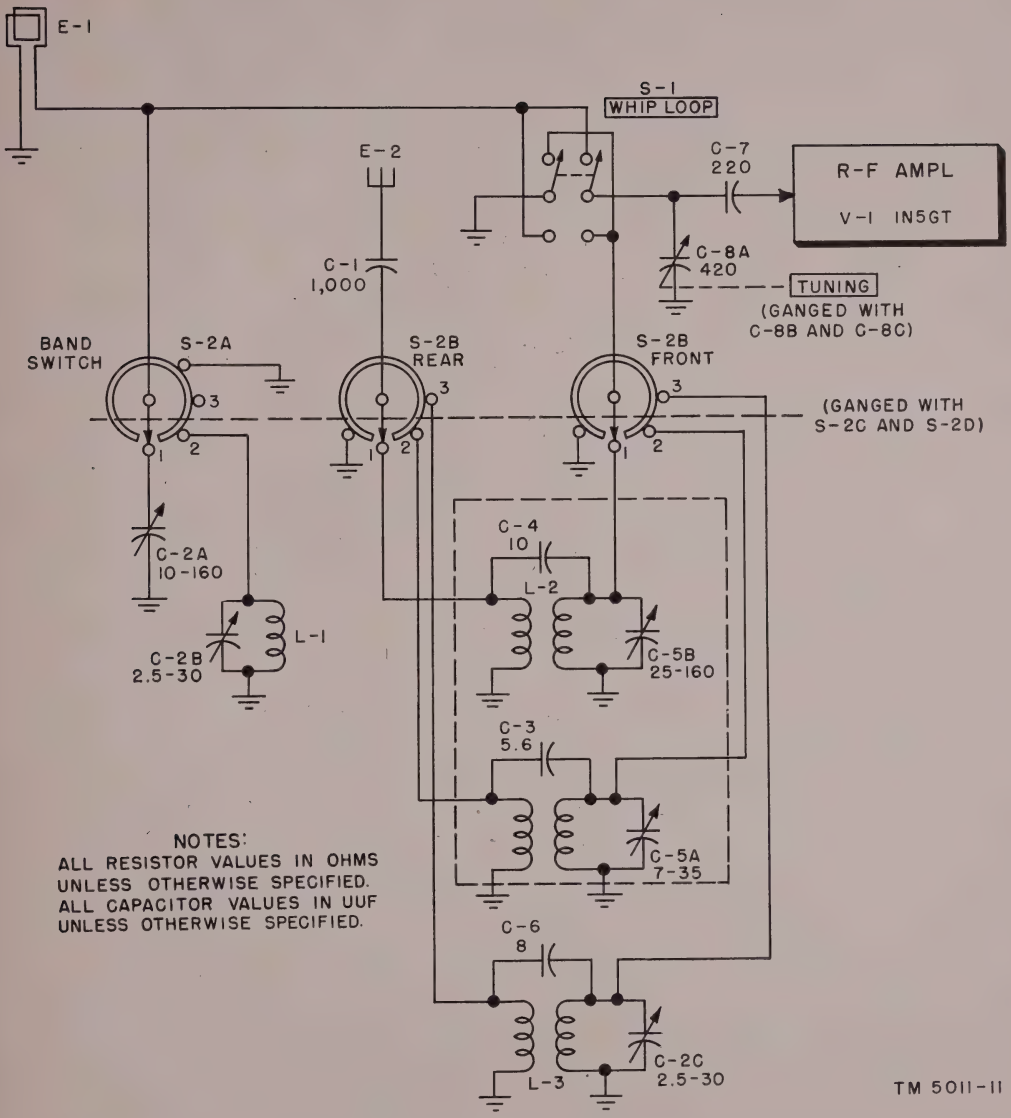


Figure 11. Antenna input circuit, schematic diagram.

capacitive coupling, however, increases with frequency and compensates for the effect of the inductive coupling. Capacitors C–4, C–3, and C–6 are the coupling elements for bands 1, 2, and 3, respectively. Trimmer capacitors C–5B, C–5A, and C–2C are used for alinement of the antenna circuit at the high end of bands 1, 2, and 3, respectively (pars. 52, 53, and 54).

c. Coupling. The output of the antenna circuit, either whip or loop circuit as determined by the setting of WHIP-LOOP switch S–1, is coupled to r-f amplifier V–1 through capacitor C–7.

28. R-f Amplifier V–1 (fig. 12)

a. R-f amplifier V–1 utilizes a type 1N5GT pentode tube. Filament voltage, approximately 1.5 volts, is supplied from either the 7½-volt A battery or from the power line (pars. 33 and 34). The ground return circuit for the directly heated cathode is through the series filament connection of V–2 and V–4. Since the grid is returned to one side of the filaments, and there is a difference of potential across the filaments, the average of this difference (approximately 0.75 volt) will be the effective bias for the stage. Screen and plate voltage for V–1 is obtained from the arm of VOLUME control R–5 (fig. 23); capacitor C–13 decouples the supply. VOLUME control R–5 may be used to vary the plate and screen voltage from a maximum value of 90 volts to practically zero, thus providing control of the receiver gain. The screen voltage is applied directly; the plate voltage is fed through the plate coils and contacts on section S–2C of the BAND switch.

b. The output of the antenna circuit is coupled to the grid of V–1 through capacitor C–7 and is developed across resistors R–1 and R–14. The amplified signal is developed in the plate circuit across a primary winding of L–5 or L–4 as determined by the setting of the band switch. On band 1, capacitor C–12 tunes a primary winding on L–5; an untuned primary winding of L–5 is used on band 2; the untuned primary winding of L–4 is used on band 3. The primary circuits are coupled inductively and capacitively to tuned secondary circuits, the capacitive coupling being used to provide uniform coupling over the entire frequency band (par. 27). Capacitors C–11, C–10, and C–9 are the capacitive coupling elements on bands 1, 2, and 3, respectively.

c. The front section of switch S–2c (fig. 12) connects the secondary circuits of L–5 and L–4 in parallel with capacitor C–8B in the signal grid input circuit of converter stage V–2. Capacitor C–8B, a section of the three-gang main TUNING capacitor, tunes the secondary circuits of L–5 and L–4 to resonance over the various bands. Capacitors C–15B, C–15A, and C–14 are trimmer capacitors used for alinement purposes on the high ends of bands 1, 2, and 3, respectively (pars. 52, 53, and 54).

29. Converter Stage V–2 (fig. 13)

Converter stage V–2, utilizing a type 1A7GT pentagrid tube, functions as an oscillator and mixer to produce a 455-kc i-f signal.

a. Filament voltage for V–2, approximately 1.5 volts, is obtained through the series connection of the filaments with the filaments of V–4, V–1, and V–3 (fig. 17). Since the grid is returned to one side of the filaments and there is a difference of potential across the filaments, the average of the potential difference (approximately 0.75 volt) will be the effective bias on the stage. Plate and screen voltage, approximately 90 volts, is obtained from the junction of resistor R–5 and capacitor C–33B (fig. 23). Plate voltage is supplied through the primary winding of i-f transformer T–1; screen voltage is supplied through dropping resistor R–3. Capacitor C–21 places the screen at r-f ground potential. Operating voltage for grid 6 (the oscillator plate) is supplied through the windings of L–6 or L–7 and the rear section of switch S–2D.

b. Grids 5 and 6 and the directly heated cathode of V–2 are connected in a triode oscillator circuit through the front and rear sections of band switch S–2D and a winding of oscillator coil L–7 or L–6. On band 1, the primary winding of L–7 and series padder C–20B are connected through S–2D in parallel with capacitor C–8C, a section of the main TUNING capacitor. The padder capacitor is used for alinement purposes on the low end of band 1 (par. 52). Trimmer capacitor C–18C also is connected in parallel with L–7 and C–8C for alinement purposes on the high end of the band. Oscillations occur in the tuned circuit composed of L–7, C–20B, C–18C, and C–8C, and are coupled to the grid, pin 5, of V–2 through capacitor C–16. The tuning range of the oscillator is from 650 to 865 kc. Gridleak bias is developed

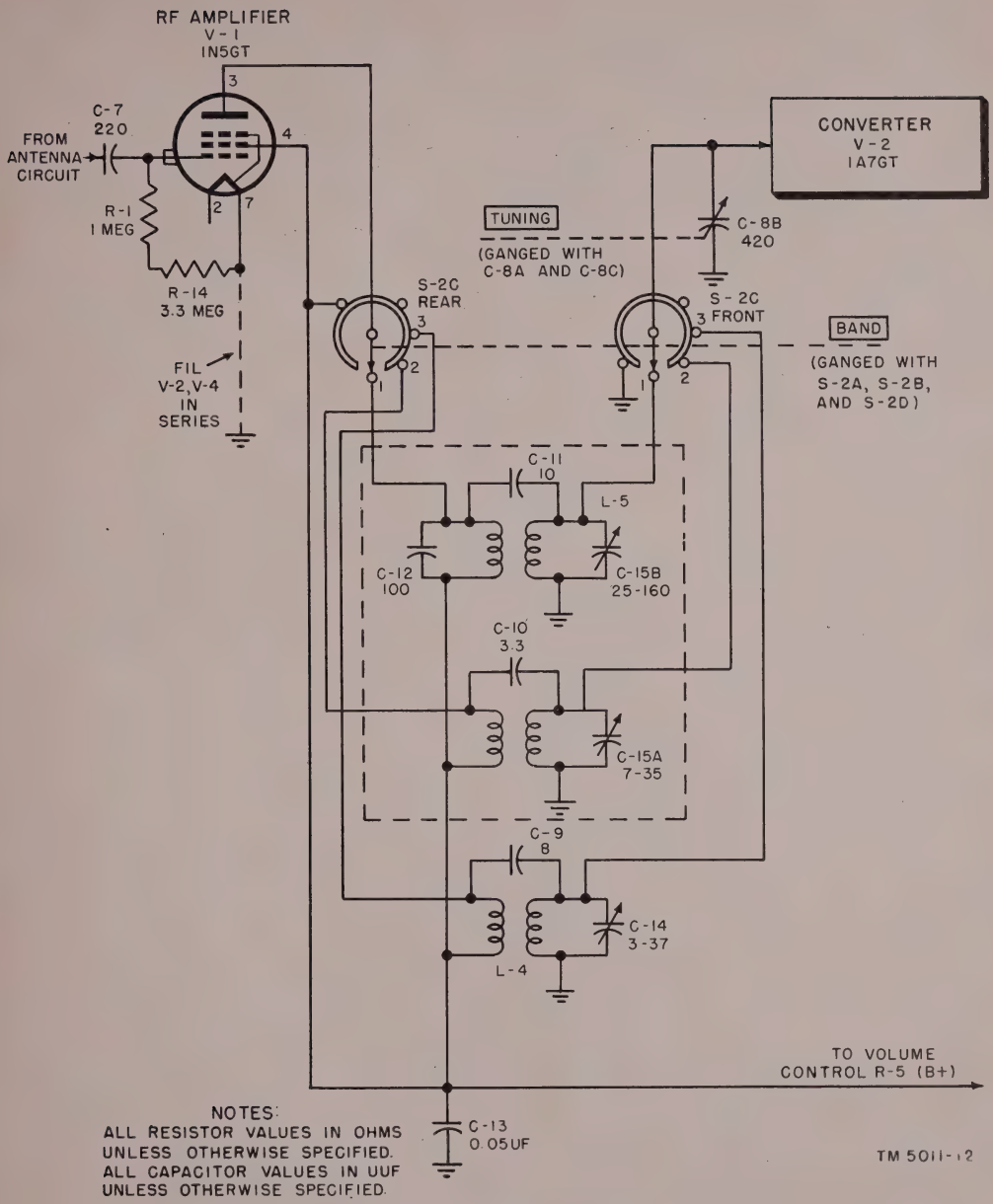


Figure 12. R-f amplifier, schematic diagram.

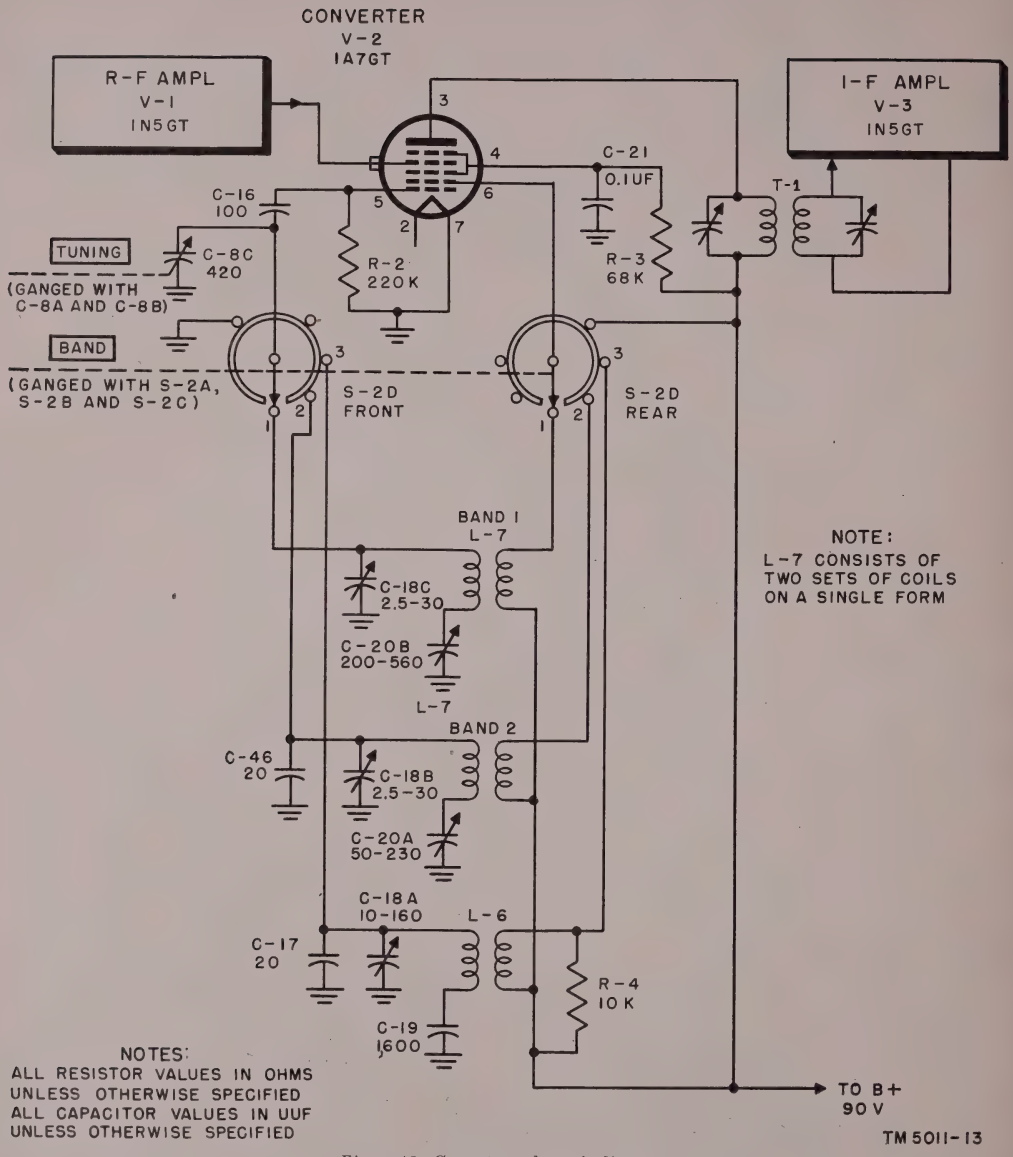


Figure 13. Converter, schematic diagram.

across resistor R–2 in the grid-cathode return circuit. To sustain oscillations, some of the oscillator output is fed from pin 6 of V–2 to the grid circuit through the rear section of S–2D and a secondary winding on L–7. The output of the oscillator is heterodyned within the tube with the r-f signal supplied to the injector grid of V–2. The tuned plate circuit of V–2 accepts the difference frequency, 455 kc.

c. Series padder C–20A and a second primary coil of L–7 are connected in parallel with the main TUNING capacitor on band 2. The oscillator range on this band is from 995 to 2,015 kc. Trimmer capacitor C–18B is provided for alinement on the high end of the band. Band 3 utilizes L–6, fixed series padder C–19, fixed trimmer capacitor C–17, and variable trimmer C–18A, all in parallel with the main TUNING capacitor. Frequency of operation is from 2,655 to 6,655 kc.

d. If the oscillator and r-f circuits are alined properly (par. 52, 53, and 54), the two inputs to converter V–2 will always differ from each other by 455 kc. Heterodyning action within the tube produces this difference frequency, as well as other beat frequencies. The tuned plate circuit, however, accepts only the 455-kc signal. The secondary of T–1 in the plate circuit couples the 455-kc signal to i-f amplifier V–3.

30. I-f Amplifier V–2 (fig. 14)

a. A type 1N5GT pentode is used for i-f amplifier V–3. Plate and screen voltage is supplied from the arm of VOLUME control R–5, the screen voltage directly, the plate voltage through the primary winding of transformer T–2. The VOLUME control may be used to vary the plate and screen voltage from a maximum value of 90 volts to practically zero. Filament voltage (approximately 1.5 volts) is supplied through the series connection of the filaments with the filaments of V–1, V–4, and V–2 (fig. 17). As in the case of the r-f amplifier and converter, the effective bias on V–3 is the average difference of potential existing between grid and filaments (approximately 0.75 volt).

b. Output from converter stage V–2 is supplied to the grid of V–3 through i-f transformer T–1. After amplification by V–3, the signal is coupled through i-f transformer T–2 to the detector—a-f amplifier stage V–4.

31. Detector—A-f Amplifier V–4 (fig. 15)

a. A dual purpose type 1H5GT tube, V–4, is used as a detector and amplifier. Transformer T–2 couples the output of i-f amplifier V–3 to the diode plate (pin 5). On positive alternations of the i-f signal, the diode conducts and develops the modulation component of the signal across resistors R–7 and R–9 in the filament circuit. Capacitor C–25 functions as an r-f bypass; capacitor C–22 places the filament of V–4 at a-f ground. The audio output across R–9 is coupled through resistor R–8 and capacitor C–24 to the grid of the triode section of V–4. Capacitor C–23 provides additional r-f bypass action.

b. The detected audio signal is developed between grid and filament of V–4 across resistor R–10. As in the case of the r-f, converter, and i-f stages, the filament voltage develops an effective bias of approximately 0.75 volt between grid and filament. Plate voltage (approximately 90 volts) is obtained from the junction of resistor R–5 and capacitor C–33B (fig. 23) through resistors R–12 and R–11. Resistor R–11 is the plate load for the stage; resistor R–12, in conjunction with capacitor C–28, decouples the plate load. The output developed across R–11 is coupled through capacitors C–27 and C–26 to a-f output stages V–5 and V–6 for battery operation and a-c—d-c operation, respectively.

32. A-f Output Stages V–5 and V–6 (fig. 16)

a. When the receiver is operated on battery power, a type 1A5GT pentode (V–5) is used in the a-f output stage. Input is coupled to the grid from the detector—a-f amplifier through capacitor C–27 and is developed between grid and cathode across resistor R–13. The grid return is made through the series filament connections of V–4, V–1, and V–3, and the drop across the filaments (approximately 5 volts) is utilized as bias. Plate and screen voltage for V–5 is obtained from the junction of resistor R–5 and capacitor C–33B (fig. 23). The screen voltage is supplied directly; the plate voltage is fed through the primary of output transformer T–3.

b. When a signal is received from detector-amplifier V–4, it is amplified by V–5 and developed across output transformer T–3. Capacitor C–30 is shunted across the primary of T–3 to improve the frequency response. The secondary of T–3

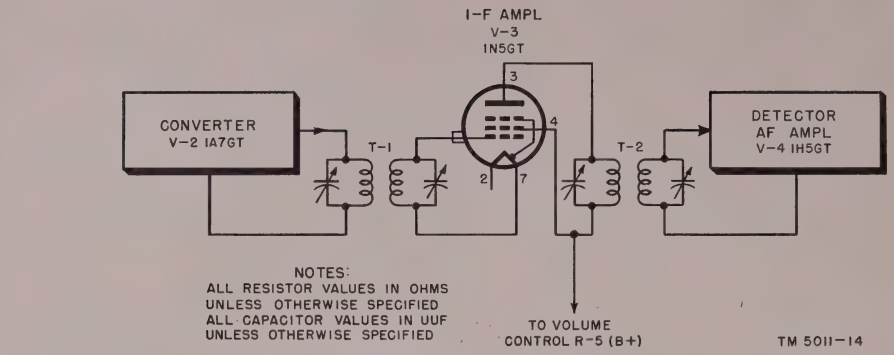


Figure 14. I-f amplifier, schematic diagram.

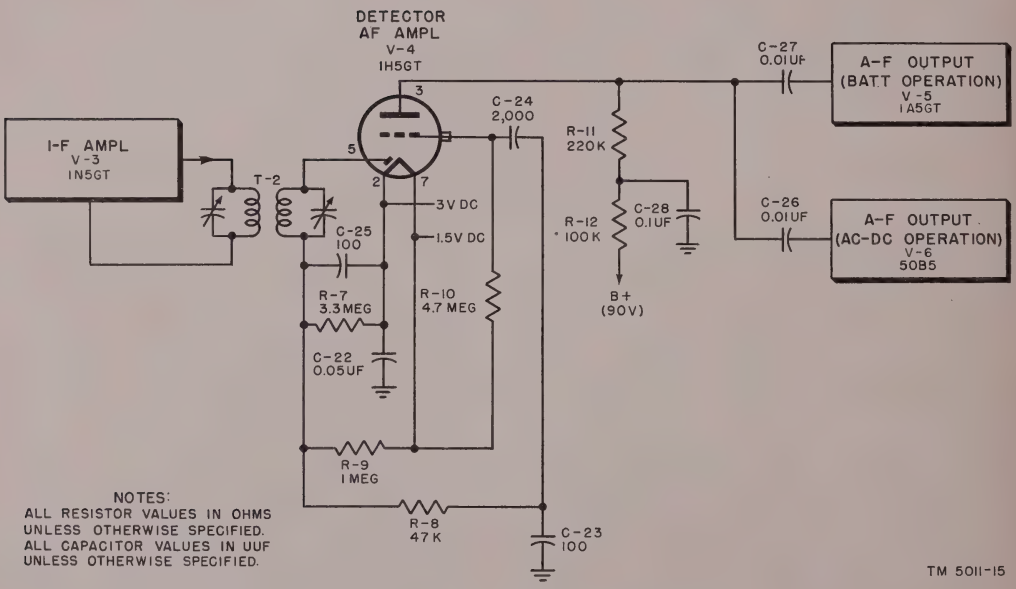


Figure 15. Detector—a-f amplifier, schematic diagram.

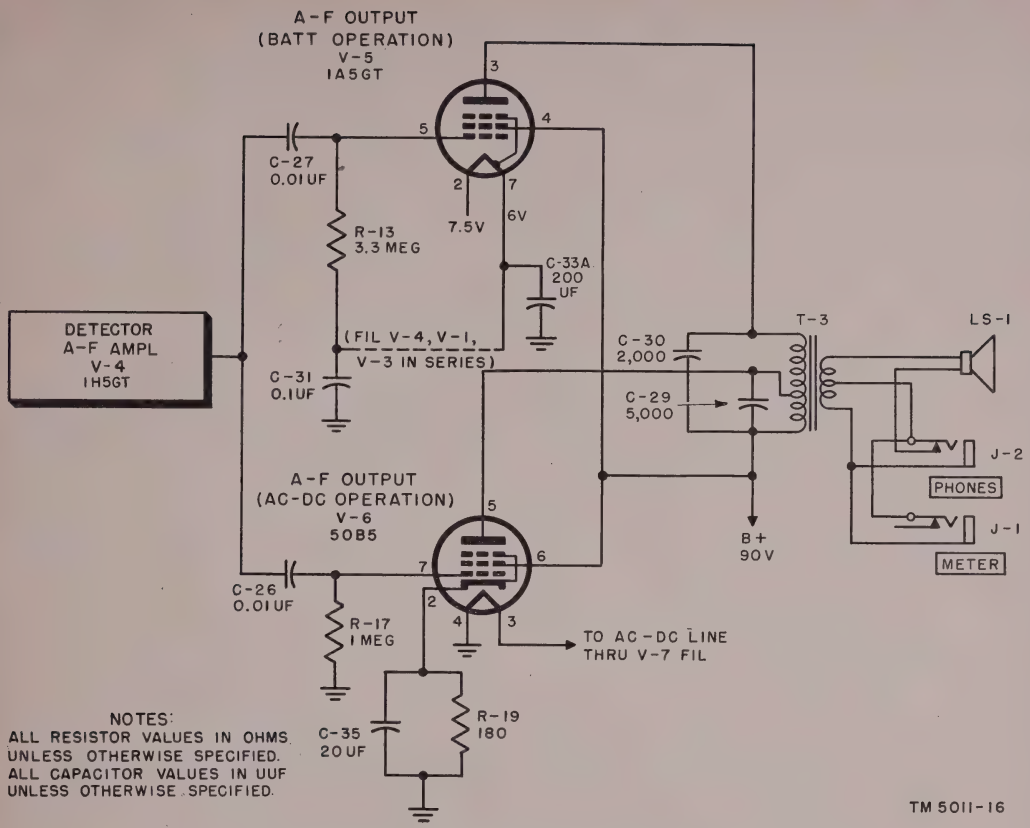


Figure 16. A-f output stages, schematic diagram.

ouples the output to loudspeaker LS–1, to PHONES jack J–2, and to METER jack J–1. If a headset is plugged into jack J–2, the speaker circuit is opened. An output meter may be plugged into jack J–1 without interfering with speaker or headset reception.

c. When the receiver is operated from an a-c or d-c power line, a type 50B5 pentode (V–6) is used in place of V–5. Input is coupled to the grid from detector—a-f amplifier V–4 through capacitor C–26 and is developed across resistor R–17 between grid and ground. Cathode bias (approximately 6 volts) is developed across resistor R–19 which is bypassed by capacitor C–35. The filament voltage for V–6 is obtained from the power line through a series connection with the filaments of rectifier V–7 (fig. 17). Plate and screen voltage connections are similar to those used for V–5 on battery operation, but only a portion of output transformer T–3 is used as a plate load. Capacitor C–29 shunts the used portion of T–3 to improve the frequency response. Output is coupled to the speaker, the PHONES jack, and the METER jack, just as in the case of battery operation.

33. A-c—d-c Power Supply Circuits (fig. 17)

a. For a-c—d-c operation of the receiver, the line cord must be connected to a 105- to 125-volt a-c of d-c power source; the OFF-ON-VOLUME control must be in the ON position; and the BATT. AC-DC switch (S–3) must be in the AC-DC position. The filaments of rectifier V–7 and a-f output tube V–6 are then connected across the line in series with the 215-ohm line cord dropping resistor, and the line voltage is supplied to the plate of the rectifier. The cathode of the rectifier is returned

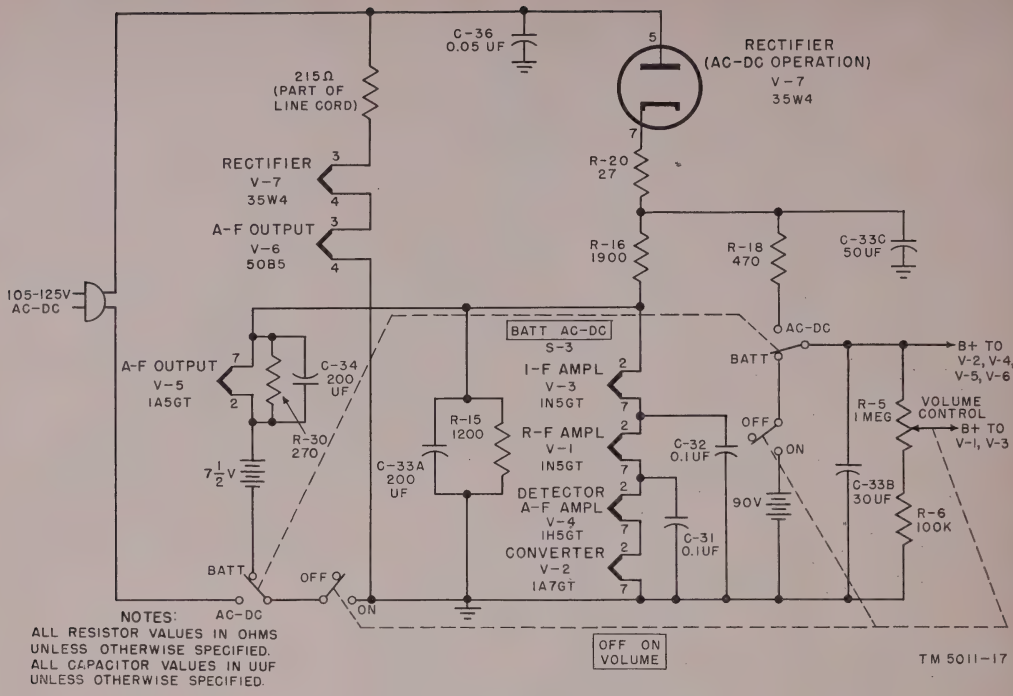


Figure 17. Power supply circuits, schematic diagram.

to ground (the low side of the power line) through resistors R–20 and R–16 and the series filament connections of V–3, V–1, V–4, and V–2. Resistor R–15 and capacitors C–33A, C–32, and C–31 provide filtering action for the filament circuit. Capacitor C–36 is a power line filter.

b. The output of rectifier V–7, taken between ground and the junction of resistors R–16 and R–20, is pure dc when a d-c line voltage is used, or pulsating dc when a-c line voltage is used. Resistor R–18, capacitor C–33C, and capacitor C–33B provide filtering action for any a-c component of the rectifier output.

c. The BATT. AC-DC switch connects a bleeder and voltage-dividing network, resistors R–18, R–5, and R–6, across the rectifier output. A 90-volt B+ bus for tubes V–2, V–4, V–5, and V–6 is tapped from the junction of resistors R–18 and R–5. VOLUME control R–5 provides a means of varying the B+ supply to tubes V–1 and V–3.

d. During a-c—d-c operation, one section of the BATT. AC-DC switch opens the 7½-volt A-battery circuit to a-f output tube V–5 and tubes V–1 through V–4; a second section of the switch opens the 90-volt B-battery circuit.

34. Battery Power Supply Circuits (fig. 17)

For battery operation of the receiver, the OFF-ON-VOLUME control must be in the ON position, and the BATT. AC-DC switch must be in the BATT. position. One contact of BATT. AC-DC switch S–3 connects the filaments of V–5, V–3, V–1, V–4, and V–2 in series across the 7½-volt A battery. Capacitor C–34 protects the filaments from the sudden surge of current which occurs when the switch is first thrown. A second contact of S–3 switches the B+ bus and VOLUME control to the 90-volt B supply consisting of two 45-volt batteries in series. The rectifier circuit and the filament circuit of V–7 and V–6 are opened by the combined action of the BATT. AC-DC switch and the OFF-ON-VOLUME control.

CHAPTER 5

FIELD AND DEPOT MAINTENANCE INSTRUCTIONS

Section I. PREREPAIR PROCEDURES

35. Tools, Materials, and Test Equipment

The tools and materials normally available in a radio repair kit are adequate for maintenance of Radio Receiver R–206A/PR; for example, Tool Equipment TE–41. For prerepair operations the only test equipment required is a reliable tube tester such as Tube Tester I–177.

36. Cleaning, Inspecting, and Testing Tubes

a. Remove all tubes in accordance with the instructions of paragraph 24*e*.

b. Clean the tubes with a cloth moistened with solvent (SD); if necessary, clean the grid caps and prongs with crocus cloth.

c. Inspect the tubes for cracks in glass and base and for bent and broken prongs.

d. Test the tubes for proper emission, leakage, and short circuits; use a tube tester or check the doubtful tubes in a receiver known to be operating normally. Replace defective tubes.

37. Cleaning and Inspecting Chassis

a. Remove the chassis by following the instructions of paragraph 25. Disconnect the chassis assembly from the loudspeaker by unsoldering the connections to the speaker.

b. Remove loose direct and dust with a brush or blower. With a brush or cloth and solvent (SD) remove dirt and grease which adheres to the chassis and parts.

c. After the chassis has been cleaned, make a thorough inspection of parts and wiring for rust, corrosion, loose connections, frayed and burned insulation, loose screws, and burned or charred resistors and coils. Inspect tube sockets for broken contacts. Inspect the band switch for loose and bent contracts and broken insulation. Repair or replace any defective parts.

38. Equipment Set-up for Trouble Shooting

Although a defective tube, defective component, or defective wiring may have been isolated and repaired as a result of the prerepair operations, it is possible that further troubles exist in the receiver At least an operational check will be necessary before the receiver is reassembled completely. To permit dynamic trouble shooting and testing, replace the tubes in the receiver, taking care to restore all original connections. If a headset or an output meter is available as an indicator, it will not be necessary to reconnect the speaker. Either the whip or loop antenna should be connected for an operational check.

Section II. TROUBLE SHOOTING AT FIELD AND DEPOT MAINTENANCE LEVEL

39. Trouble-Shooting Procedures

Effective trouble shooting requires the systematic application of several basic techniques. The following subparagraphs describe these techniques briefly. Paragraphs 42 through 45 illustrate specific applications of the general techniques.

a. The first step in trouble shooting a defective Radio Receiver R–206A/PR is to *sectionalize* the fault. Sectionalization means tracing the fault to the circuit, stage, or group of stages responsible for abnormal operation of the set; for example: to the power supply, the antenna circuit, i-f stages, etc.

b. The second step in trouble shooting a defective receiver is to *localize* the fault. Localization means tracing the fault to the defective part responsible for the abnormal conditions.

c. The procedures listed below (items (1) through (7)) are common techniques for both sectionalization and localization. Remember that

the servicing procedure should cause no further damage to the receiver; utilize the techniques accordingly. Generally, it will be found advantageous to use the techniques in the order in which they are listed.

(1) *Visual inspection.* Some faults, such as burned-out resistors and frayed or broken wiring, often can be located by a visual inspection of the equipment. Paragraph 37 outlines the inspection procedure.

(2) *Power circuit resistance and voltage measurements.* These measurements (par. 42) prevent further damage to the receiver from possible short circuits. Since this test gives an indication of the condition of the filter circuits, its function is more than preventive.

(3) *Operational test.* Careful observation of the equipment during operation may sectionalize the fault to a particular circuit or may eliminate some circuits as possible trouble sources. Refer to paragraph 23.

(4) *Trouble-shooting chart.* Some common symptoms and their causes are listed in the trouble-shooting chart (par. 43). The chart will aid in the rapid localization of some troubles.

(5) *Signal substitution.* The principal advantage of the signal substitution method (par. 44) is that it usually enables the repairman to sectionalize a trouble accurately and quickly when the general location of the trouble is not immediately evident from the type of checks listed above.

(6) *Tube socket voltage and resistance measurements.* Tube socket voltage and resistance measurements (par. 45; fig. 19) generally are necessary to localize trouble to a particular part. These measurements will supplement the substitution procedure.

(7) *Intermittents.* In all of the checks listed above, the possibility of intermittents should not be overlooked. If present, intermittents often may be made to appear by tapping or jarring the set.

d. The successful application of all trouble-shooting techniques is dependent basically upon reliable test equipment and proper utilization of the available data. Paragraphs 40 and 41 list the trouble-shooting data available in this manual and the test equipment required for complete trouble shooting.

40. Trouble-Shooting Data

Take advantage of the material supplied in this manual. It will help in the rapid localization of faults. Consult the following trouble-shooting data:

Fig. No.	Description
4	Radio Receiver R–206A/PR, interior view.
7	Radio Receiver R–206A/PR, top view of chassis.
8	Radio Receiver R–206A/PR, disassembly instructions.
9	Radio Receiver R–206A/PR, bottom view of chassis.
10	Radio Receiver R–206A/PR, block diagram.
18	Location of subchassis check points.
19	Tube socket voltage and resistance measurements.
23	Radio Receiver R–206A/PR, schematic diagram.
24	Do.

41. Test Equipment Required for Trouble Shooting

The test equipment required for trouble shooting Radio Receiver R–206A/PR is listed below. The technical manuals associated with the test equipment are also listed.

Test equipment	Technical manual
Signal Generator I–72 or equal	TM 11–307
Oscillator I–151 or equal	TM 11–2524
Tube Tester I–177 or equal	TM 11–2627
Test Unit I–176 or equal	TM 11–2626

42. Power Circuit Resistance and Voltage Checks

a. With the chassis removed from the carrying case (par. 25) and after a visual inspection has been made (par. 37), check the resistance of the filament and power supply circuits before applying power to the receiver. The following chart lists important check points, with normal and abnormal readings and possible sources of trouble. Make all measurements with the OFF-ON-VOLUME control in the extreme clockwise position, the BATT. AC-DC switch at AC-DC, and the line cord disconnected. Refer to figures 9, 18, and 20 for location of parts.

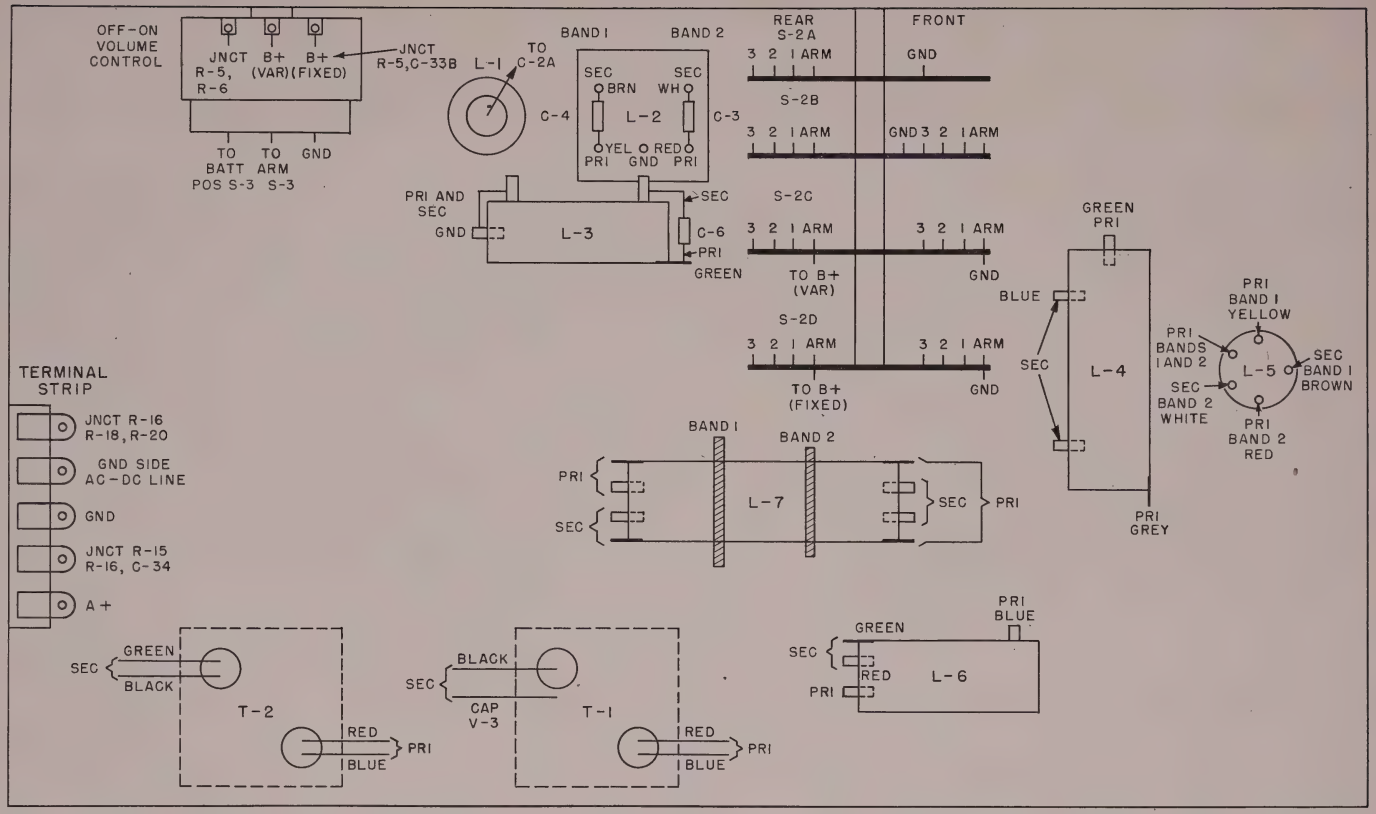


Figure 18. Location of subchassis check points.

Check point	Normal reading	Abnormal reading	Probable trouble and check procedure
Prongs of plug on line cord	350	0	Check for shorted capacitor C–36.
		Infinity	Check for open filament on V–6 or V–7, or for open line cord dropping resistor.
Junction of R–5 and C–33B (right-hand terminal on VOLUME control as viewed from rear) to ground.	2, 500	0	Check for shorted capacitor C–13 or C–33B.
		500	Check for shorted capacitor C–33C.
Pin 7 of V–7 to ground	2, 000	27	Check for shorted capacitor C–33C.
		450	Check for shorted capacitor C–33B.
Pin 2 of V–3 to ground	60	0	Check for shorted capacitor C–33A or C–32.
		1, 200	Check for open filament on V–1, V–2, V–3, or V–4.
		36	Check for shorted capacitor C–31.

b. If the resistance readings taken in accordance with the above instructions are normal, energize the receiver and check for normal voltage (approximately 90 volts) at the junction of R–5 and C–33B. If normal voltage is available, continue the trouble shooting as outlined in paragraphs 43 and 44.

43. Trouble-shooting Chart

The chart which follows indicates some common troubles and their probable causes. If the visible or audible indications correspond to the symptoms listed, use of the chart may simplify trouble-shooting procedures. Reference to the schematic diagram (fig. 23) and to the chassis layout diagram (fig. 18) will help in the location of check points.

Symptom	Probable trouble	Check procedure and corrective measures
No output on battery operation; a-c—d-c operation normal.	Battery plugs not connected	Check connections at rear of receiver (fig. 20); insert plugs.
	Worn-out batteries	Check output at battery terminals; replace if defective.
	Broken battery plugs or wiring	Check continuity from plug tips to connections on chassis terminal strip (fig. 18) and BATT. AC-DC switch; replace defective wiring.
	Defective BATT. AC-DC switch S–3.	Check continuity from negative terminal of A battery to ground; check for 90 volts at right-hand terminal of VOLUME control (viewed from rear); replace defective switch.
	Tube V–5 out of socket	Insert tube properly.
	Defective tube V–5	Check tube and replace if defective.
No output on a-c—d-c operation; battery operation normal.	Reversed polarity (d-c operation only).	Reverse line cord connection in power outlet.
	Defective line cord, BATT. AC-DC switch S–3, tube V–6, or tube V–7.	Check continuity from each prong of line cord to chassis (OFF-ON and BATT. AC-DC switches closed). One prong should show a reading of 0 ohms, indicating continuity through S–3 and the OFF-ON switch; the other prong should measure approximately 400 ohms, indicating continuity through the line cord and the filaments of V–6 and V–7. Check also for a 0 reading from the 400-ohm prong to pin 5 of V–7. Check emission of V–7 since filaments of V–1 through V–4 are in series with the plate-cathode circuit of V–7 on a-c—d-c operation. Replace defective switch, defective tube, or defective line cord.
No output on either battery or a-c—d-c operation.	Defective tube V–1, V–2, V–3, or V–4.	Check tubes; replace if defective.
	Defective audio transformer T–3.	Check for a resistance of approximately 1,000 ohms across primary of T–3; check continuity of secondary; check also for possible shorts in C–29 and C–30. Replace defective component.

Symptom	Probable trouble	Check procedure and corrective measures
No output on either battery or a-c—d-c operation.	Defective OFF-ON switch	Check for lighting of any of the filaments and for voltage output at the right-hand terminal of the VOLUME control. Replace switch.
	No plate or screen voltage	Check for shorted capacitor C–13, C–33B, C–21, or C–28. Check wiring from arm (center terminal) of VOLUME control to V–1 and V–3, from right-hand terminal of VOLUME control to V–2, V–4, and V–5. Replace defective capacitor or wiring.
No output for LOOP position of S–1.	Defective switch S–1	Check continuity of switch contacts. Replace switch.
	Defective wiring	Check continuity from loop antenna terminals (fig. 8) to S–1 and from loop antenna terminal to S–2A. Replace defective wiring.
	Shorted loop	Check for a resistance of approximately 17 ohms across the loop. Disconnect loop and check to determine whether short is in loop or another circuit component. Replace defective component.
No output for WHIP position of S–1.	Defective switch S–1	Check continuity of switch contacts. Replace switch.
	Defective wiring	Check continuity from whip antenna socket to capacitor C–1, from C–1 to switch S–2B, and from S–2B to S–1. Replace defective wiring.
No output on band 1	Defective tuning coils	Check band 1 sections of oscillator coil L–7, r-f coil L–5, antenna coil L–2, and (for loop operation only) antenna capacitor C–2A.
	Misalinement	Check the alinement of band 1 (par 52).
No output on band 2	Defective tuning coils	Check band 2 sections of oscillator coil L–7, r-f coil L–5, antenna coil L–2, and (for loop operation only) antenna coil L–1.
	Misalinement	Check the alinement of band 2 (par 53).
No output on band 3	Defective tuning coils	Check oscillator coil L–6, r-f coil L–4, and antenna coil L–3.
	Misalinement	Check the alinement of band 3 (par. 54).
Weak reception	Defective tubes	Check tubes in a tube tester or insert new tubes for comparison. Replace if defective.
	Broken antenna leads	Check leads to loop and whip for weak operation on loop and whip antennas, respectively.
	Weak batteries (battery operation only).	Check batteries; replace if necessary.
	Improper alinement	Check the alinement adjustments (pars. 51 through 54).
No output to headset	Defective wiring	Check wiring to jack J–2.
No speaker cut-out when headset is used.	Defective jack J–2	Check jack J–2.
	Defective wiring	Check wiring to jack J–2.
Headset output; no speaker output.	Defective wiring	Check wiring to speaker and to jack J–2.
No output at METER jack	Defective wiring	Check wiring to jack J–1.

44. Trouble Shooting by Signal Substitution Method

a. General. Signal substitution is a logical method of tracing trouble to a stage. Once trouble has been isolated to a stage, voltage and resistance measurements should localize trouble to a particular part. Before using the signal substitution method, make a visual inspection for obvious troubles and check the power circuits as outlined in paragraph 42. The steps of the procedure are arranged in a logical sequence so that a normal indication at any test point eliminates, as trouble sources, all circuits between the test point and the receiver output. A normal indication for all steps is output on the loudspeaker, headset, or meter. No output indicates trouble between the test point and the receiver output. The final column of the chart lists check procedures which are applicable for abnormal indications.

b. Equipment Set-up.

(1) Remove the chassis from the case (par.

25). Reconnect the antenna circuits after the chassis has been removed.

(2) Short out the local oscillator by connecting a jumper between pin 5 of V–2 and ground.

(3) Connect the line cord to an a-c—d-c power source and energize the receiver.

(4) When using a signal generator, ground the low side of the generator output to the chassis of the receiver through a 0.1-uf (microfarad) capacitor.

(5) In feeding an audio signal to the receiver, use a 0.1-uf capacitor in series with the high side of the generator output.

(6) In feeding an r-f signal to the receiver, use a 20-uuf (micromicrofarad) capacitor in series with the high side of the generator output.

c. Signal Substitution Trouble-Shooting Chart.

Note. The probable troubles listed are based on an assumption of normal putput from the power supply. At each step of the chart, a normal indication is assumed for the previous step.

Step No.	Test point and signal input	Check procedure and probable causes of abnormal indications
1	Inject audio signal at pin 3 of V–5 (battery operation) or pin 5 of V–6 (a-c—d-c operation).	Check for abnormal socket voltages (fig. 19); for open winding on transformer T–3; for shorted capacitor C–30 (battery operation) or shorted capacitor C–29 (a-c—d-c operation).
2	Inject audio signal at pin 5 of V–5 (battery operation) or pin 7 of V–6 (a-c—d-c operation).	Check for a defective tube; check for an open grid circuit. If output is distorted, check for a shorted coupling capacitor, C–26 and C–27 for a-c—d-c and battery operation, respectively.
3	Inject audio signal at pin 3 of V–4	Check for abnormal socket voltages (fig. 19). If only battery operation is abnormal, check for defective capacitor C–27; for abnormal a-c—d-c operation, check for defective capacitor C–26.
4	Inject audio signal at cap (grid) of V–4.	Check for a defective tube, abnormal socket voltages, open grid circuit, open resistor R–11 or R–12, or shorted capacitor C–28.
5	Inject an a-m 455-kc signal at pin 5 of V–4.	Check for open winding on transformer T–2, for open resistor R–8, or for defective capacitor C–23, C–24, or C–25.
6	Inject an a-m 455-kc signal at pin 3 of V–3.	Check for abnormal socket voltages; check for open winding on transformer T–2. Check alinement of T–2 (par. 51).
7	Inject an a-m 455-kc signal at cap (grid) of V–3.	Check for defective tube; check for open winding on transformer T–1. Check alinement of T–1 (par. 51).
8	Inject an a-m 455-kc signal at pin 3 of V–2.	Check for abnormal socket voltages; check for open winding on transformer T–1. Check alinement of T–1 (par. 51).
9	Inject an a-m 455-kc signal at grid cap of V–2.	Check for defective tube; check for defective capacitor C–21. Check alinement of T–1 (par. 51).

Before performing step 10, remove the jumper between pin 5 of V–2 and ground, and connect it between the whip antenna terminal (fig. 8) and ground. Place the WHIP-LOOP switch in the WHIP position.

Step No.	Test point and signal input	Check procedure and probable causes of abnormal indications
10	Place the band switch in position 1 and inject an a-m r-f signal (between 195 and 410 kc) at the grid cap of V–2. Adjust the TUNING control to obtain an output indication.	Check for abnormal voltages at pins 5 and 6 of V–2 (fig. 19); if voltages are missing, check continuity of band 1 windings on L–7; check switch contacts of S–2D; check oscillator alinement (par. 52).
11	Without changing controls, inject the same signal (step 10) at pin 3 of V–1.	Check for abnormal socket voltages (fig. 19); check continuity of band 1 winding on L–5; check switch contacts of S–2C; check alinement of r-f circuits (par. 52).
12	Inject the test signal at cap (grid) of V–1.	Check for defective tube; check for open grid circuit.

Remove the jumper from the whip antenna terminal and tune in a signal.

Step No.	Test point and signal input	Check procedure and probable causes of abnormal indications
13	If it is impossible to tune in a station, inject the test signal at the antenna terminal.	Check the continuity of the band 1 section of L–2; check switch contacts of S–2B; check alinement of antenna circuits (par. 52).
14	Repeat steps 10 through 13 with the band switch in position 2 and a test signal between 540 and 1,560 kc. Short the antenna terminal if necessary.	Check continuity of band 2 sections of L–7, L–5, and L–2. Check switch contacts of S–2D, S–2C, and S–2B. Check alinement (par. 53).
15	Repeat steps 10 through 13 with the band switch in position 3 and a test signal between 2,200 and 6,200 kc	Check continuity of L–6, L–4, and L–3. Check switch contacts of S–2D, S–2C, and S–2B. Check alinement (par. 54).

Place the WHIP-LOOP switch in the LOOP position and return the band switch to position 1.

Step No.	Test point and signal input	Check procedure and probable causes of abnormal indications
16	If it is impossible to tune in a station, inject a test signal (within the band 1 range) at the loop antenna terminal. Vary the TUNING control to obtain an output indication.	Check the loop resistance (17 ohms across the outside terminals) with the loop disconnected; check switch contacts of S–2A; check alinement.
17	Repeat step 16 with the band switch at position 2 and with a signal in the band 2 range.	Check continuity of L–1; check switch contacts of S–2A; check alinement.

45. Voltage and Resistance Measurements

a. Normal voltage and resistance measurements for the tube sockets of the receiver are shown on figure 19. Utilize these measurements in conjunction with signal substitution and other trouble-shooting procedures to isolate trouble to a particular part. It should be realized that the readings given are typical but are subject to some variance (as much as 20 percent) from set to set. Additional continuity checks are listed in *b* below. For location of the various check points, refer to figures 18 and 19.

b. The continuity checks listed below will help to isolate troubles in the tuning coils or band switching circuits. Note the positions of the band switch and the WHIP-LOOP switch for the various measurements, since the measurements hold only for the positions listed.

Point of measurement	Band switch position	WHIP-LOOP switch position	Resistance	Parts checked	Remarks
Loop antenna terminal (red lead) to ground.	1	LOOP	Infinity	S–2A, C–2A	If loop is connected, reading should be 15 ohms.
	2	do	7	S–2A, L–1, C–2B	If loop is connected, reading should be 4 ohms
	3	do	Infinity	S–2A	If loop is connected, reading should be 15 ohms.
Junction L–2 primary and C–4 to ground (fig. 18).	1		280	Band 1 primary coil of L–2.	Check points on band switch if coil terminals are inaccessible. Each coil should show a 0 reading if band switch is in any but the indicated position.
Junction L–2 primary and C–3 to ground.	2		110	Band 2 primary coil of L–2.	
Junction L–3 primary and C–6 to ground.	3		16	Primary coil of L–3	

Point of measurement	Band switch position	WHIP-LOOP switch position	Resistance	Parts checked	Remarks
Junction of S–1 and S–2B to ground. (See Remarks column.)	1	WHIP	10	S–2B, band 1 secondary coil of L–2, C–5B.	The green lead on the front section of S–2B (left-hand side as viewed from rear) is the proper check point. Placing WHIP-LOOP switch in LOOP position should result in 0 readings.
	2	do	4	S–2B, band 2 secondary coil of L–2, C–5A.	
	3	do	0. 5	S–2B, band 3 secondary coil of L–3, C–2C.	
Grid cap of V–1 to pin 7 of V–1.			4 meg	R–1, R–14	
Pin 3 of V–1 to arm (center terminal) of VOLUME control.	1		300	S–2C, band 1 primary coil of L–5, C–12.	Windings on L–5 and L–4 may be checked directly at the coil terminals (fig. 18).
	2		240	S–2C, band 2 primary coil of L–5	
	3		22	S–2C, primary coil of L–4.	
Grid cap of V–2 to ground.	1		29	S–2C, band 1 secondary coil of L–5, C–15B.	Windings on L–5 and L–4 may be checked directly at the coil terminals (fig. 18).
	2		8	S–2C, band 2 secondary coil of L–5, C–15A.	
	3		1	S–2C, secondary coil of L–4, C–14.	
Junction of C–16 and C–8 to junction of L–7 and C–20B.	1		7	S–2D, band 1 primary coil of L–7.	The junction of C–16 and C–8 is located on the band switch (lowest terminal on right-hand side, front section of S–2D). The other points may be checked at the the coil terminals (fig. 18).
Junction of C–16 and C–8 to junction of L–7 and C–20A.	2		3	S–2D, band 2 primary coil of L–7.	The junction of C–16 and C–8 is located on the band switch (lowest terminal on right-hand side of front section of S–2D). The other points may be checked at the coil terminals (fig. 18).
Junction of C–16 and C–8 to junction of L–6 and C–19.	3		2	S–2D, primary coil of L–6.	
Pin 6 of V–2 to B+ bus (right-hand terminal of VOLUME control).	1		3	S–2D, band 1 secondary coil of L–7.	Windings on L–7 and L–6 may be checked directly at the coil terminals (fig. 18).
	2		1	S–2D, band 2 secondary coil of L–7.	
	3		2	S–2D, R–4; secondary coil of L–6.	
Pin 3 of V–2 to B+ bus			15	Primary coil of T–1	
Grid cap of V–3 to pin 7 of V–3.			22	Secondary coil of T–1.	
Pin 3 of V–3 to arm (center terminal) of VOLUME control.			22	Primary coil of T–2	
Pin 5 of V–4 to junction of R–9, R–7, and C–25.			14	Secondary coil of T–2	
Pin 3 of V–5 to pin 5 of V–6.			900	T–3 primary (a-c–d-c operation).	
Pin 3 of V–5 to B+ bus			1, 200	T–3 primary (battery operation).	
T–3 secondary leads with speaker disconnected (fig. 18).			0. 5	T–3 secondary	

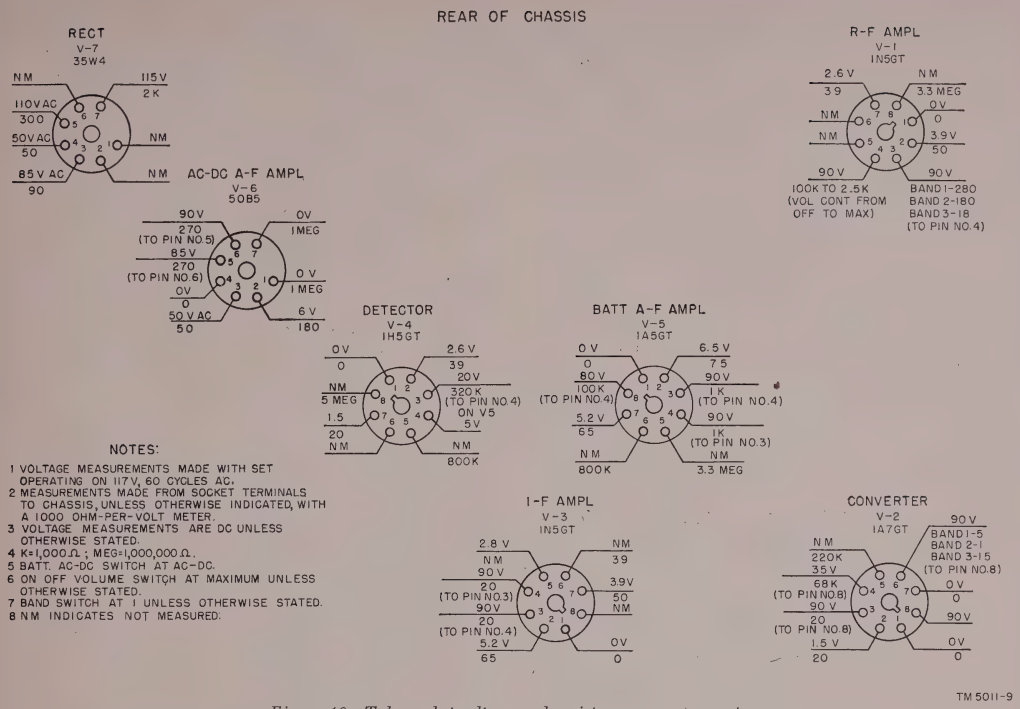


Figure 19. Tube socket voltage and resistance measurements.

46. Replacement of Parts

Most of the parts in Radio Receiver R–206A/PR are readily accessible and may be easily replaced if necessary. In some cases a good part will have to be removed or unsoldered to allow access to a damaged part. Careless replacement of parts often makes new faults inevitable. Note the following points:

a. Before a part is unsoldered, note the position of the leads. If the part, such as band switch S–2, has a number of connections, tag each of the leads to it.

b. Be careful not to damage other leads by pulling or pushing them out of the way or carelessly exposing them to the heat of the soldering iron.

c. Do not allow drops of solder to fall into the set since they may cause short circuits.

d. A carelessly soldered connection may create a new fault. It is very important to make well-soldered joints, since a poorly soldered joint is one of the most difficult faults to find.

e. When a part is replaced in r-f or i-f circuits, the placement of the original part should be duplicated exactly. A part which has the same electrical value but different physical size may cause trouble in high-frequency circuits. Give particular attention to proper grounding when replacing a part. Use the same ground as in the original wiring. Failure to observe these precautions may result in decreased gain or possibly in oscillation of the circuit.

Section III. ALINEMENT PROCEDURES

47. Precautions

Radio Receiver R–206A/PR has been completely alined prior to shipment. In the event of abnormal operation, all possible sources of trouble should be checked (par. 39) before changing the initial alinement of the receiver. Only qualified repair personnel should attempt realinement.

48. Test Equipment Required

The test equipment required for alining Radio Receiver R–206A/PR is listed in *a* through *e* below.

a. Signal Generator. The signal generator must provide accurately calibrated signals over the entire range of the receiver (195 to 6,200 kc). Signal Generator I–72–( ) is satisfactory.

b. Output Meter. The output meter should be a rectifier type a-c voltmeter with a 0- to 5-volt scale. Test Set I–56–( ) is satisfactory.

c. Alinement Tool. A nonmetallic screw driver is required for alining the receiver.

d. Dummy Antennas and Isolation Capacitor. A 0.1-uf capacitor and a 20-uuf capacitor are required for use as dummy antennas during the alinement procedure. A 0.1-uf capacitor is also required for use in the ground lead between the signal generator and the receiver chassis.

e. Frequency Meter. If a frequency meter is available, it should be used for testing the accuracy of the signal generator at its various settings during alinement (par. 49). Frequency Meter Set SCR–211–( ) is adequate.

49. Calibration of Signal Generator

If a frequency meter is available, the signal generator should be checked for accuracy at each of the test signals used. To make the checks, perform the steps in *a* through *f* below.

a. Place the signal generator and the frequency meter near each other. Turn on both equipments and allow them to warm up for at least 15 minutes.

b. Attach a piece of wire to the output connection of the signal generator and place the wire near the antenna of the frequency meter.

c. Calibrate the frequency meter according to the instructions furnished with the meter.

d. Set the frequency meter to the exact frequency at which the signal generator is to be used.

e. While listening with the headset connected to the frequency meter, tune the signal generator about the approximate frequency until a zero beat is obtained. The signal generator will then be set for the exact frequency.

f. Turn off the frequency meter and remove the wire attached to the output connection of the signal generator.

50. Preliminary Steps

a. With the exception of antenna trimmer capacitors C–2A, C–2B, and C–2C, all alinement controls are accessible through the rear of the receiver. To gain access to these controls, remove the four screws which hold the back of the cabinet in place, remove the back, and swing the loop antenna to one side (fig. 4). Access to antenna trimmers C2–A, C–2B, and C–2C may be obtained by removing the nameplate on the front of the receiver (fig. 2). The location of all alinement controls is indicated in figure 20.

b. With the TUNING control in the maximum counterclockwise position (tuning capacitor fully open), adjust the dial pointer so that it is in line with the encircled numeral ① on band 1.

c. Plug the output meter into the METER jack on the receiver panel. Adjust the meter controls for a-c measurements on the 0- to 5-volt scale.

d. Connect the ground terminal of the signal generator to the chassis of the receiver through a 0.1-uf capacitor.

e. Plug the line cord of the receiver into an outlet for 105 to 125 volts ac or dc. Place the BATT. AC-DC switch in the AC-DC position, and turn the OFF-ON-VOLUME control to its maximum clockwise position. Leave the control at maximum for all the tuning adjustments.

f. Turn on the signal generator. Allow the receiver and signal generator to warm up for several minutes.

51. I-f Alinement Procedure

a. Connect the output of the signal generator to the grid cap of converter stage V–2 (fig. 20) through a 0.1-uf capacitor. Adjust the generator to supply a modulated 455-kc signal.

b. With the TUNING control set approximately in the center of its range (dial pointer at 1000 on band 2) adjust the two trimmers on output i-f transformer T–2 and the two trimmers on input i-f transformer T–1 (fig. 20) for maximum indications on the output meter. Keep the meter reading near midscale by reducing the signal generator output, if necessary, during the tuning procedure. Repeat the adjustments on T–2 and T–1 several times to insure peak tuning.

c. Disconnect the signal generator output from the grid of i-f stage V–3.

52. Band 1 Alinement

a. With the WHIP-LOOP switch in the WHIP position and the band switch in the No. 1 position, connect the signal generator output to the whip antenna socket through a 20-uuf capacitor.

b. Adjust the signal generator to provide a 400-kc signal and turn the TUNING control of the receiver until the dial pointer is at 400 on band 1.

c. Adjust, in the order indicated, oscillator trimmer C–18C, r-f trimmer C–15B, and antenna trimmer C–5B (fig. 20) for maximum indications on the output meter.

d. Set the signal generator for 220 kc, and turn the receiver TUNING control until the dial pointer is at 220 on band 1.

e. Adjust oscillator padder C–20B (fig. 20) and simultaneously rock the TUNING control to obtain a maximum indication on the output meter.

f. Return the signal generator controls and the receiver TUNING control to the 400-kc settings, and readjust oscillator trimmer C–18C, r-f trimmer C–15B, and antenna trimmer C–5B for maximum output.

g. Repeat steps *d*, *e*, and *f* above.

h. Place the WHIP-LOOP switch in the LOOP position and place the loop in is operating position. Connect approximately 6 inches of wire in series with the lead from the generator, and place the wire approximately 1 inch from the loop.

i. With the generator and the receiver set at 400 kc, adjust antenna trimmer C–2A (fig. 20) for maximum reading on the output meter.

53. Band 2 Alinement

a. Place the WHIP-LOOP switch in the WHIP position and the band switch in the No. 2 position. Connect the signal generator to the whip antenna socket through the 20-uuf capacitor.

b. Adjust the signal generator to provide a 1,400-kc signal and turn the TUNING control of the receiver until the dial pointer is at 1400 on band 2.

c. Adjust, in the order indicated, oscillator trimmer C–18B, r-f trimmer C–15A, and antenna trimmer C–5A (fig. 20) for maximum indications on the output meter.

d. Set the signal generator for 600 kc and turn the receiver TUNING control until the dial pointer is at 600 on band 2.

e. Adjust oscillator padder C–20A (fig. 20) and simultaneously rock the TUNING control to obtain a maximum indication on the output meter.

f. Return the signal generator controls and the receiver TUNING control to the 1,400-kc settings, and readjust oscillator trimmer C–18B,

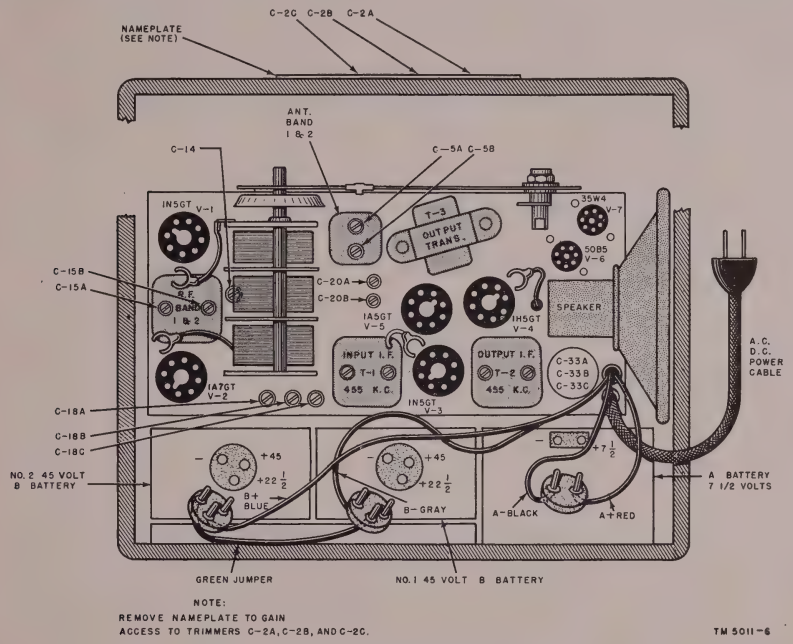


Figure 20. Location of alinement adjustments.

r-f trimmer C–15A, and antenna trimmer C–5A for maximum output.

g. Repeat steps *d*, *e*, and *f* above.

h. Place the WHIP-LOOP switch in the LOOP position and couple the signal generator to the loop as in *h* of paragraph 52.

i. With the generator and the receiver set at 1,400 kc, adjust antenna trimmer C–2B (fig. 20) for maximum reading on the output meter.

54. Band 3 Alinement

a. Place the WHIP–LOOP switch in the WHIP position and the band switch in the No. 3 position. Connect the signal generator to the whip antenna socket through the 20-uuf capacitor.

b. Adjust the signal generator to provide a 6-mc signal and turn the TUNING control of the receiver until the dial pointer is at 6.0 on band 3.

c. Adjust oscillator trimmer C–18A (fig. 20) for maximum indication on the output meter.

d. Adjust, in the order indicated, r-f trimmer C–14 and antenna trimmer C–2C. Rock the TUNING control while making these adjustments.

CHAPTER 6

SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

55. Repacking for Shipment or Limited Storage

a. The exact procedure in repacking for shipment or limited storage depends upon the material available and the conditions under which the equipment is to be shipped or stored. Refer to figure 3 for an illustration of the original packaging. Duplicate the original packing procedure if possible.

b. Whenever practicable, place a dehydrating agent such as silica gel inside the chests. Protect the chests with a waterproof paper barrier. Seal the seams of the paper barrier with waterproof sealing compound or tape. Pack the protected chests in a padded wooden case, providing at least 3 inches of excelsior padding or some similar material between the paper barrier and the packing case.

Note. If Radio Receiver R–206A/PR must be repacked for shipment or for limited storage within the scope of the using arms and services in the zone of the interior, the batteries should be disconnected and removed from the receiver.

Section II. DEMOLITION OF MATÉRIEL TO PREVENT ENEMY USE

56. Demolition Notice

When ordered by your commander, demolish this equipment in order to prevent the enemy from using or salvaging it. However, act only upon orders from your commander. Proceed as follows:

a. Smash the cabinet, whip antenna, receiver chassis, tubes, and batteries, using sledges, axes, handaxes, pickaxes, crowbars, or heavy tools.

b. Cut the power cable, battery cables, loop wires, and grid cap wires, using axes, handaxes, or machetes.

c. Burn the loop frame, cabinet, speaker, wiring, coils, resistors, capacitors, and technical manual, using gasoline, kerosene, oil, flame throwers, or incendiary grenades.

d. Bend the plates of the variable tuning capacitor.

e. If *explosives* are necessary, use firearms, grenades, or TNT.

f. Bury or *scatter* the destroyed parts in slit trenches, fox holes, or other holes, or throw them into streams.

g. Destroy everything.

APPENDIX I

REFERENCES

Note. For availability of items listed, check SR 310–20–3 for field manuals, training circulars, training aids, Army training programs, JANAP's, tables of organization and equipment (T/O&E's), tables of allowances (T/A's), and tables of basic allowances (T/BA's). Check FM 21–6 for technical manuals, technical bulletins, supply bulletins, modification work orders, and changes. Check Department of the Army Supply Catalog SIG 1 for Signal Corps supply catalogs.

1. Army Regulations

AR 380–5, Safeguarding Military Information.

2. Supply Publications

SIG 1, Introduction and Index.
SIG 5, Stock List of All Items.
SIG 7 AND 8, Organizational Maintenance Allowances and Field and Base Maintenance Stockage Guide.
SB 11–6, Dry Battery Supply Data.
SB 11–17, Electron Tube Supply and Reference Data.
SB 11–76, Signal Corps Kit and Materials for Moisture- and Fungi-Resistant Treatment.

3. Technical Manuals on Auxiliary Equipment and Test Equipment

TM 11–300, Frequency Meter Sets SCR–211–(*).
TM 11–303, Test Sets I–56–C, –D, –H, and –J.
TM 11–307, Signal Generators I–72–G, H, J, and K.
TM 11–321, Test Set I–56–E.
TM 11–2613, Voltohmmeter I–166.
TM 11–2626, Test Unit I–176.
TM 11–2627, Tube Tester I–177.

4. Painting, Preserving, and Lubrication

TB SIG 13, Moistureproofing and Fungiproofing Signal Corps Equipment.

5. Demolition

FM 5–25, Explosives and Demolitions.

6. Packaging and Packing Instructions

a. Joint Army-Navy Packaging Specifications.
JAN–D–169, Desiccants, Activated.
JAN–P–100, General Specifications.
JAN–P–106. Boxes, Wood, Nailed.
JAN–P–116, Preservation, Methods of.
JAN–P–125, Barrier Material, Waterproof.
JAN–P–131, Barrier Material, Moisture-Vaporproof, Flexible.
b. U. S. Army Specification.
100–2E, Marking Shipments by Contractors (and Signal Corps Supplement thereto).
c. Signal Corps Instructions.
720–7, Standard Pack.
726–15, Interior Marking.

7. Other Publications

SR 310–20–3, Index of Field Manuals, Training Circulars, Firing Tables and Charts, Graphic Training Aids, Army Training Programs, JANAP's, Combined Communications Board Publications, Tables of Organization and Equipment, Tables of Allowances, and Tables of Basic Allowances.
MWO SIG 11–5011–1, Modification of Radio Receiver R–206/PR to Provide Characteristics Suitable for Radio Range Checking.
TB SIG 25, Preventive Maintenance of Power Cords.
TB SIG 66, Winter Maintenance of Signal Equipment.
TB SIG 72, Tropical Maintenance of Ground Signal Equipment.

TB SIG 75, Desert Maintenance of Ground Signal Equipment.
TB SIG 123, Preventive Maintenance Practices for Ground Signal Equipment.
TB SIG 178, Preventive Maintenance Guide for Radio Communication Equipment.
TM 1–455, Electrical Fundamentals.
TM 11–314, Antennas and Antenna Systems.
TM 11–455, Radio Fundamentals.
TM 38–650, Basic Maintenance Manual.

8. Forms

NME Form 6 (Report of Damaged or Improper Shipment).
DA AGO Form 468 (Unsatisfactory Equipment Report).
AF Form 54 (Unsatisfactory Report).

9. Abbreviations

a-c	alternating-current
a-f	audio-frequency
a–m	amplitude-modulated
d-c	direct-current
i-f	intermediate-frequency
kc	kilocycles
mw	milliwatts
PM	preventive maintenance
r-f	radio-frequency
uf	microfarad
uuf	micromicrofarad

10. Glossary

Refer to the glossary in TM 11–455.

APPENDIX II

IDENTIFICATION TABLE OF PARTS

Note. The fact that a part is listed in this table is not sufficient basis for requisitioning the item. Requisitions must cite an authorized basis, such as T/O&E, TE, T/A, T/BA, SIG 10, list of allowances of expendable material, or another authorized supply basis. Catalogs of the Department of the Army Supply Catalog applicable to the equipment covered in this manual are listed in paragraph 1 below.

1. Supply Catalog

The following information was compiled on 13 January 1949. The appropriate catalog of the Department of the Army Supply Catalog for Radio Receiver R–206A/PR is—

Fixed Plant Maintenance Lists

SIG 10–R–206/PR

For an index of available catalogs, see the latest issue of Department of the Army Supply Catalog SIG 1.

2. Identification Table of Parts for Radio Receivers R–206 and R–206A/PR

Reference symbol	Models		Name of part and description	Function of part	Signal Corps stock No.
	R–206/PR	R–206A/PR			
	*	*	RADIO RECEIVER R–206/PR; R–206/APR: AM; for communications; frequency range 195–410-kc, 540–1560 kc, 2200–6200 kc in 3 bands; 105 to 125 v, 50/60 cps AC, DC, 20 w, operates from self-contained batteries; 12″ lg x 6½″ wd x 10″ h overall; 6 tube superheterodyne ckt.	Radio communication and radio range checking.	2C4573
	*	*	TECHNICAL MANUAL: TM 11–5011	To provide operating, maintenance, and repair literature for Radio Receiver R–206A/PR.	(Order through AGO channels)
	*	---	BOOK, instruction: Lear "Avia" 50231	To provide operating, maintenance, and repair literature for Radio Receiver R–206/PR.	6D9502
E–1	---	*	ANTENNA: loop type; for receiving; wood frame, term board for 3 wire term, 50 turns of wire tapped at 8 turns, 144 ft 32SSE wire; 10$\frac{3}{16}$″ lg x 7$\frac{1}{16}$″ wd x 1¾ ″ thk overall; Lear part/dwg 53711.	Loop antenna	2A288A–91
E–2	---	*	ANTENNA: whip type; for receiving; tubr brass; 66$\frac{3}{16}$″ extended, 14″ collapsed, ⅜″ OD max; 5 sections, ea 14″ lg; Lear part/dwg 50233.	Whip antenna	2A288A–90

Reference symbol	Models R-206/PR	Models R-206A/PR	Name of part and description	Function of part	Signal Corps stock No.
W–1	---	*	CABLE ASSEMBLY, special purpose: 2 cond approx #18 c/o 7 #27 AWG copper strands and 1 cond #34 AWG solid resistance wire, 215 ohms; 150 vacw; oval 3/16" x 1/4"; 5 ft lg excluding terminations; flat molded rubber connector, plug w/2 flat parallel male contacts on 1 end, tinned leads at other end, connecting leads color-coded; Lear part/dwg #54935.	A-c—d-c line cord	3E7350–1.60.1
C–10	---	*	CAPACITOR, fixed: ceramic; 3 mmf ± mmf; 500 vdcw; 0.562" lg x 0.250" diam; JAN type CC21AJ030F.	R-f coupling, coil L–5	3D9003–23
C–3	*	---	CAPACITOR, fixed: ceramic; 6 mmf ± mmf; 500 vdcw; 0.562" lg x 0.25" diam; JAN type CC21AH060F.	C–3: R-f coupling, transformer T–1.	3D9006–36
C–39	*	---		C–39: Antenna input coupling.	
C–3	---	*		C–3: R-f coupling, coil L–2.	
C–6	---	*	CAPACITOR, fixed: ceramic; 8 mmf ± 0.5 mmf; 500 vdcw; 0.400" lg x 0.200" diam; JAN type CC20SK080D.	C–6: R-f coupling, coil L–3	3D9008–28
C–9	---	*		C–9: R-f coupling, coil L–4	
C–40	*	---	CAPACITOR, fixed: ceramic; 10 mmf ± mmf; 500 vdcw; 0.562" lg x 0.250" diam; JAN type CC21AH100F.	C–40: R-f coupling, transformer T–5.	3D9010–87
C–4	---	*		C–4: R-f coupling, coil L–2.	
C–11	---	*		C–11: R-f coupoing, coil L–5.	
C–41	*	---	CAPACITOR, fixed: ceramic; 20 mmf ±10%; 500 vdcw; 0.562" lg x 0.25" diam; JAN type CC21UK200K.	C–41 and C–17: Oscillator tuning, band 3.	3D9020–42
C–17	---	*		C–46: Oscillator tuning, band 2.	
C–46	---	*			
C–2	*	---	CAPACITOR, fixed: mica; 43 mmf ±5%; 500 vdcw; max body dimen 51/64" lg x 15/32" wd x 7/32" thk; JAN type CM20B431K.	Antenna input coupling	3K2043122
C–16	*	*	CAPACITOR, fixed: mica; 100 mmf ±10% 500 vdcw; max body dimen; 51/64" lg x 15/32" wd x 7/32" h; JAN type CM20B101K.	C–16: Oscillator grid coupling, converter stage.	3K2010121
C–24	*	---		C–24: R-f bypass, detector stage.	
C–12	---	*		C–12: V–1 plate tuning, band 1.	
C–23	---	*		C–23: R-f bypass, V–4.	
C–25	---	*		C–25: R-f bypass, V–4.	
C–7	---	*	CAPACITOR, fixed: mica; 220 mmf ±10%; 500 vdcw; max body dimen 51/64" lg x 15/32" wd x 7/32" thk; JAN type CM20B221K.	R-f coupling, V–1	3K2022121
C–7	*	---	CAPACITOR, fixed: mica 250 mmf ±10%; 500 vdcw; 23/32" lg x 15/32" wd x 3/16" h; Micamold type #0.	C–7: Input coupling, r–f amplifier.	3DK9250–60
C–25	*	---		C–25: R-f bypass, detector a-f amplifier.	
C–1	---	*	CAPACITOR, fixed: mica; 1,000 mmf ±10%; 500 vdcw; max body dimen 1 1/16" lg x 15/32" wd x 7/32" thk; JAN type CM25B102K.	R-f coupling, whip antenna	3K2510221
C–20	*	---	CAPACITOR, fixed: mica; 1,600 mmf ±5%; 500 vdcw; 53/64" lg x 53/64" wd x 9/32" thk; JAN type CM30B162J.	Oscillator padding, band 3	3K3016222
C–19	---	*			
C–24	---	*	CAPACITOR, fixed: paper; 2,000 mmf, +40%, −20%; 400 vdcw; 1 1/8" lg x 3/8" diam; Lear part/dwg #56614.	C–24: Audio coupling, V–4	3DA2–196
C–30	---	*		C–30: Frequency compensation, transformer T–3.	

Reference symbol	Models R-206/FR	Models R-206A/FR	Name of part and description	Function of part	Signal Corps stock No.
C–26	*		CAPACITOR, fixed: paper; 2,000 mmf ±10%; 600 vdcw; ¾'' lg x ¾'' wd x ¼'' thk; AWS #CN35A202.	C–26: Audio coupling, detector—a-f amplifier. C–31: Frequency compensation, transformer T–11.	3DA2–175
C–31	*				
C–32	*		CAPACITOR, fixed: paper; 6,000 mmf ±20%; 600 vdcw; 1 5/16'' lg x ½'' diam; JAN type CP26A1DF602M.	C–32: Frequency compensation, transformer T–11. C–29: Frequency compensation, transformer T–3.	3DA6–102
C–29		*			
C–26		*	CAPACITOR, fixed: paper; 10,000 mmf ±20%; 600 vdcw; 1 5/16'' lg x ½'' diam; JAN type CP26A1DF103M.	C–26: Audio coupling, V–6. C–27: Audio coupling, V–5.	3DA10–394
C–27		*			
C–1	*		CAPACITOR, fixed: paper; 10,000 mmf ±20%; 600 vdcw; ¾'' lg x ¾'' wd x ¼'' thk; Tobe #DP.	C–1: Antenna input coupling. C–29: Audio coupling, a-f output stages.	3DA10–208
C–29	*				
C–11	*		CAPACITOR, fixed: paper; 50,000 mmf ±20%; 600 vdcw; 1 1/16'' lg x 1 1/16'' diam; JAN type CP26A1DF503M.	C–11 and C–13: B+ decoupling. C–27 and C–22: R-f bypass, detector filaments. C–33 and C–36: A-c line r-f bypass.	3DA50–313
C–13		*			
C–27	*				
C–22		*			
C–33	*				
C–26		*			
C–23	*				
C–21		*	CAPACITOR, fixed: paper; 100,000 mmf ±10%; 200 vdcw; 1 13/16'' x 1 1/16'' diam; JAN type CP26A1DC104K.	C–23 and C–21: Converter screen r-f bypass. C–30 and C–28: Audio decoupling detector—a-f amplifier. C–34 and C–31: Filament r-f bypass. C–32 Filament r-f bypass.	3DA100–843
C–30	*				
C–28		*			
C–34	*				
C–31		*			
C–32		*			
C–35		*			
			CAPACITOR, fixed: electrolytic; 20 mf ±150%, −10%; 25 vdcw; 1 1/16'' lg x 13/16'' diam; Lear part/dwg #60003.	Cathode bypass, V–6	3DB20–121
C–38	*		CAPACITOR, fixed: electrolytic; 200 mf +150%, −10%; 10 vdcw; 2'' lg x ¾'' diam; Lear part/dwg #54057.	Surge protection, 1A5GT filament.	3DB200–17
C–34		*			
C–35	*		CAPACITOR, fixed; electrolytic; 3 sect; 20–40 mf, 150 vdcw, 200 mf, 6 vdcw; 1'' diam x 2 1/16'' h case; three ½'' lg solder lug on bottom; 3 twist type mtg lugs on bottom at 0.368'' rad x 120 deg mtg/c; Sprague type #FP.	C–35 and C–36: B+ filter. C–37: Filament filter.	3DB200–11
C–36	*				
C–37	*				
C–33A, B, C		*	CAPACITOR, fixed: electrolytic; 3 sect; 1 sect 50 mf, 1 sect 30 mmf, 1 sect 200 mf; 50-mf and 30-mf sect 150 vdcw, 200-mf sect 6 vdcw; 2½'' lg x 1 7/64'' diam excluding term; sprague type #FP per Lear part/dwg #53738.	C–33A; Filament filter. C–33B and C–33C: B+ filter.	3DB200–18
C–42	*		CAPACITOR, fixed: dry electrolytic: 400 mf; 10 vdcw; 2 5/16'' lg x 13/16'' diam; Illinois Condenser #1HC–40010.	Filament bypass	3DB400–1
C–14		*	CAPACITOR, variable: mica; compression type, single sect; 3 to 37 mmf; 250 vacw; 13/16'' lg x 5/8'' wd x 9/16'' h overall; 2 mtg tabs on 0.514'' ctr; Lear part/dwg #56748.	R-f trimming, band 3	3D9037V–2

Reference symbol	Models R-206/PR	Models R-206A/PR	Name of part and description	Function of part	Signal Corps stock No.
C–4	*		CAPACITOR, variable: mica; compression type, 3 sect; cap 1 sect 10 to 160 mmf, cap other 2 sect 2.5 to 30 mmf; 350 v RMS; 1⅞″ lg x 13/16″ wd x 25/32″ h overall; two ⅛″ diam mtg holes in base on 1¼″ ctrs, Teleradio Eng #18–F–84PT–5.	C–4: Antenna trimming, band 2. C–5: Antenna trimming, band 3. C–6: Antenna trimming. band 1. C–2A; Loop antenna trimming, band 1. C–2B; Loop antenna trimming, band 2. C–2C: Whip antenna trimming, band 3.	3D9160V–7
C–5	*				
C–6	*				
C–2A, B, C		*			
C–17	*		CAPACITOR, variable: mica; compression type, 3 sect; cap 1 set 10–160 mmf, cap other 2 sect 2.5 to 30 mmf; 300 vact; 3⅛″ lg x 25/32″ wd x 29/32″ h overall; 2 mtg holes 0.144″ diam on 2¾″ mtg/c; Teleradio Eng #MT–43C.	C–17: Oscillator trimming, band 3. C–18: Oscillator trimming, band 2. C–19: Oscillator trimming, band 1. C–18A: Oscillator trimming, band 3. C–18B: Oscillator trimming, band 2. C–18C: Oscillator trimming, band 1.	3D9160V–8
C–18	*				
C–19	*				
C–18A, B, C		*			
C–5A, B		*	CAPACITOR, variable; mica; compression type, 2 sect; cap 1st sect 7 to 35 mmf, cap 2d sect 25 to 160 mmf; 250 vacw; 1 1/16″ sq x ¾″ overall; 2 mtg holes 0.120″ diam on 9/16″ mtg/c; Lear part/dwg #53795.	C–5A: Whip antenna trimming, band 2. C–5B: Whip antenna trimming, band 1. C–15A: R-f trimming, band 2. C–15B: R-f trimming, band 1.	3D9160V–11
C–15A, B		*			
C–8A, B, C		*	CAPACITOR, variable: air; plate meshing type, 3 sect; 0 to 420 mmf ea sect; SLF modified tuning characteristic; 3 29/32″ lg x 2 13/32″ wd x 2 3/16″ h overall, shaft ¼″ diam x 1⅜″ lg FMS: 27 polished aluminum plates ea sect; solder lug term; 4 mtg holes tapped #6–32 on bottom; RMA #M4–101 split shaft std knurl, 2⅛″ dial drive pulley pressed on shaft; Amer Steel Pack type #Bs.	C–8A: R-f tuning, V–1. C–8B: R-f tuning, V–2. C–8C: Oscillator tuning, V–2.	3D9420V–2
C	*		CAPACITOR, variable: air; 3 sect; ea sect 12.5 mmf to 420 mmf; 4 1/16″ lg x 2⅜″ wd x 2¼″ h, ¼″ diam x 9/16″ lg shaft; 27 plates per sect; 3 #6–32 thd tapped mtg holes, 1″ ctrs except ctr hole staggered ⅞″ from mtg line; shaft straight knurled 13/32″ lg, end slotted ½″ d; Amer Steel Pack #A102.	R-f and oscillator tuning	3D9420V–1
C–20A, B		*	CAPACITOR, variable: mica; compression type, 2 sect; cap 1 sect 50 to 230 mmf, cap other sect 200 to 560 mmf; 250 vacw; 1 13/32″ lg x ¾″ wd x ¾″ h overall; 1 mtg hole 0.140″ diam; Lear part/dwg #53713.	C–20A: Oscillator padding, band 2. C–20B: Oscillator padding, band 1.	3D9560V

Reference symbol	Models R-206/PR	Models R-206A/PR	Name of part and description	Function of part	Signal Corps stock No.
C–21	*	---	CAPACITOR, variable: mica; 2 sect; 60 to 350 mmf and 250 to 650 mmf; 350 v RMS; 1 7/16'' lg x 3/4'' wd x 3/4'' h; two 0.144'' diam centering holes w/one 0.144'' diam mtg hole in ctr, 2 5/64'' ctrs; Teleradio Eng #C–3473.	C–21: Oscillator padding, band 2. C–22: Oscillator padding, band 1.	3D9650V
C–22	*	---			
T–1	*	---	COIL, RF: antenna; 2 windings, 1 single layer and 1 pie wound; unshielded; 2 5/8'' lg x 3/4'' OD x 1 3/16'' h overall; mts by term; 4 solder lug term, 2 at ea end; Std Coil Prod #A–50220.	Antenna tuning, band 3	3C323–140B
T–2	*	---	COIL, RF: antenna; 4 pie universal windings; shielded by natural finish, rectangular aluminum can; 1 3/16'' x 1 3/16'' x 2 7/8'' h; two #6–32 thd x 5/16'' lg spade bolts on bottom at 1 1/8'' mtg/c; 5 solder lug term on bottom; Std Coil Prod #50221.	Antenna tuning, bands 1 and 2.	3C323–140C.
T–5	*	---	COIL, RF: transformer; 2 windings, 1 single layer and 1 pie universal wound; unshielded; 2 5/8'' lg x 3/4'' OD x 1 1/16'' h overall; 4 solder lug term, 2 at ea end, 1 of which is at right angle to form length; Std Coil Prod #A–50160.	R-f tuning, band 3	3C323–140D
T–6	*	---	COIL, RF: transformer; 4 pie windings; shielded by natural finish rectangular aluminum can; 1 1/4'' x 1 1/4'' x 2 3/4'' h; built-in variable mica capacitor; two #6–32 thd x 3/8'' lg spade bolts on bottom at 1 3/16'' mtg/c; 5 solder lug term and 1 wire lead in bottom; Std Coil Prod #T–302.	R-f tuning, bands 1 and 2	3C323–140A
T–7	*	---	COIL, RF: oscillator; 2 windings, 1 single	Oscillator tuning, band 3	3C323–140F
L–6	---	*	layer wound, 1 pie universal wound; unshielded; 2 1/4'' lg x 1 9/32'' diam overall; bakelite form, air core; 2 solder lugs at ea end of form; Std Coil Prod #50236.		
T–8	*	---	COIL, RF: oscillator; 4 windings of 2 pie universal wound; unshielded; 7/8'' OD x 3'' lg overall; 7 solder lug term; 3 at 1 end, 4 at other end; Std Coil Prod #T404.	Oscillator tuning, bands 1 and 2.	3C323–140H
L–1	---	*	COIL, RF: antenna shunt; single winding, universal wound; unshielded; 3/4'' lg x 1/2'' diam overall; molded bakelite form, air core; 2 axial wire leads; Lear part/dwg #62952.	Loop shunt, band 2	3C1084Z36–2
L–2	---	*	COIL, RF: antenna; 4 windings, universal wound; 2 pri and 2 secd; rectangular aluminum shield case; 1 1/8'' sq x 2 3/4'' h overall; 2 built-in trimmer capacitors; mts; w/2 spade bolts on 1'' mtg/c; 5 solder lug term on bottom; Lear part/dwg #62928.	Whip antenna tuning, bands 1 and 2.	3C1084Z36–3
L–3	---	*	COIL, RF: antenna; 2 windings, pri universal wound; secd solenoid wound; unshielded; 1 5/8'' lg x 2 1/32'' diam excluding term; bakelite form, air core; term mtd; 2 solder lug term at ea end of form; Lear part/dwg #62927.	Whip antenna tuning, band 3.	3C1084Z36–4

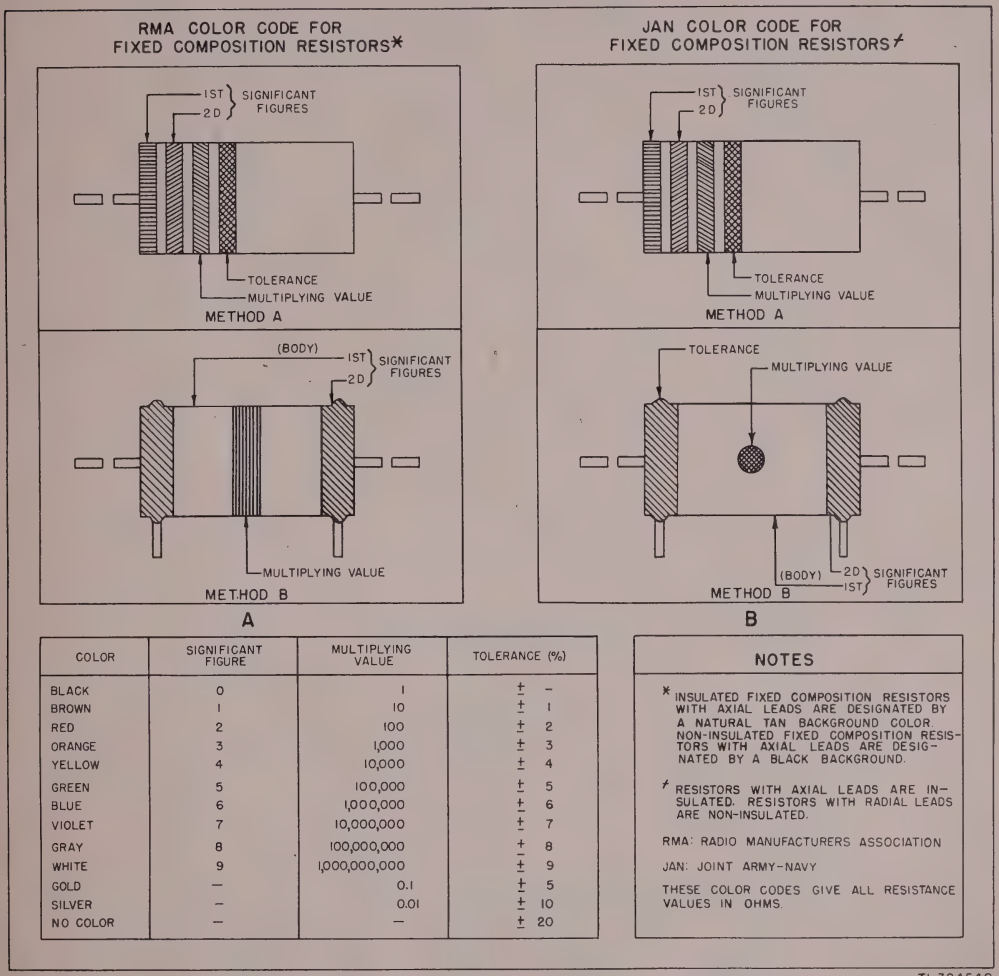
Reference symbol	Models R-206/PR	Models R-206A/PR	Name of part and description	Function of part	Signal Corps stock No.
L–4	---	*	COIL, RF: RF transformer; 2 windings, pri universal wound, secd solenoid wound; unshielded; 1⅝″ lg x 21/32″ diam excluding term; bakelite form, air core; 2 solder lug term at ea end of form; Lear part/dwg #50160.	R-f tuning, band 3	3C1084Z36–5
L–5	---	*	COIL, RF: RF transformer; 2 windings, universal wound; rectangular aluminum shield case; 1¼″ sq x 3¾″ h overall; bakelite form, air core; built-in trimmer capacitors; scdr adj through top of can; 2 spade bolts on 1 3/16″ mtg/c; 5 solder lug term on bottom, 1 lead out of bottom; Lear part/dwg #53740.	R-f tuning, bands 1 and 2	3C1084Z36–6
L–7	---	*	COIL, RF: oscillator; 4 windings universal wound for 2 bands; unshielded; 2⅝″ lg x 1 1/16″ diam overall; bakelite form, air core; 4 solder lugs at ea end of form; Lear part/dwg #53739.	Oscillator tuning, bands 1 and 2.	3C1084Z36–7
J–1	*	---	JACK JK–33–A: for 3 cond plug 0.2063″ diam; 1¼″ lg x 15/16″ diam overall; J2 contact arrangement; ⅜″ mtg hole.	METER jack	2Z5533A
J–2	*	---	JACK, telephone: for 2 cond plug 0.25″ diam;	J–2: PHONES jack	2Z553136
J–1	---	*	1 3/16″ lg x 1 5/16″ wd x 1 5/16″ h overall; J4	J–1: METER jack.	
J–2	---	*	contact arrangement; ⅜″ mtg hole; Utrad type 1 J–102–2A IMP short jack.		
	---	*	MOUNTING, antenna: for whip antenna; brass; 1⅛″ diam x 3/32″ thk flange at top, ½″ diam x ¾″ lg body w/½″–20 thd; 1¼″ diam x 25/32″ lg overall; mts into ½″ hole, held by nut; Lear part/dwg #50234.	Whip antenna mounting	2A2665–20
H–5	---	*	NUT, hexagon: brass; ½″–20 NF–2; 5/16″ thk; ⅞″ wd across flats; Lear part/dwg #50323.	Whip antenna socket fastener.	6L3508–20–14
R–20	---	*	RESISTOR, fixed: composition; 27 ohms ±10%; 1 w; max body dimen 0.750″ lg x 0.280″ diam; JAN type RC30BF270K.	Current limiting, V–7	3RC30BF270K
R–2	*	---	RESISTOR, fixed: composition; 30 ohms ±5%; ½″ w; max body dimen 0.468″ lg x 0.249″ diam; JAN type RC20BF300J.	Oscillator grid bias	3RC20BF300J
R–19	---	*	RESISTOR, fixed: composition; 180 ohms ±10%; ½ w; max body dimen 0.468″ lg x 0.249″ diam; JAN type RC20BF181K.	Cathode bias, V–6	3RC20BF181K
R–30	---	*	RESISTOR, fixed: composition; 270 ohms ±10%; ½ w; max body dimen 0.468″ lg x 0.249″ diam; JAN type RC20BF271K.	C–34 discharge	3RC20BF271K
R–17	*	---	RESISTOR, fixed: composition; 470 ohms	B+ filter	3RC41BF471K
R–18	---	*	±10%; 2 w; max body dimen 1.78″ lg x 0.506″ diam; JAN type RC41BF471K.		
R–10	*	---	RESISTOR, fixed: composition; 1,200 ohms	R–10: Isolation	3RC20BF122K
R–18	*	---	±10%; ½ w; max body dimen 0.468″ lg x	R–18 and R–15; Filament	
R–15	---	*	0.249″ diam; JAN type RC20BF122K.	shunting.	
R–16	---	*	RESISTOR, fixed: WW; 1900 ohms ±10%; 10 w at 275° C max continuous oper temp; 1¾″ lg x 5/16″ diam; Utrad #10 VWQ.	Filament voltage dropping	3Z6190–14
R–5	*	---	RESISTOR, fixed: composition; 10,000 ohms	Oscillator coil shunt, band 3	3RC20BF103K
R–4	---	*	±10%; ½ w; max body dimen 0.468″ lg x 0.249″ diam; JAN type RC20BF103K.		

Reference symbol	Models R-206/PR	Models R-206A/PR	Name of part and description	Function of part	Signal Corps stock No.
R–6	*	---	RESISTOR, fixed: composition; 39,000 ohms ±10%; ½ w; max body dimen 0.468" lg x 0.249" diam JAN type RC20BF393K.	R-f filter, detector—a-f amplifier.	3RC20BF393K
R–8	---	*	RESISTOR, fixed: composition; 47,000 ohms ±10%; ½ w; max body dimen 0.468" lg x 0.249" diam; JAN type RC20BF473K.	R-f filter, detector—a-f amplifier.	3RC20BF473K
R–4	*	---	RESISTOR, fixed: composition; 68,000 ohms ±10%; ½ w; max body dimen 0.468" lg x 0.249" diam; JAN type #RC20BF683K.	Converter screen voltage dropping.	3RC20BF683K
R–3	---	*			
R–13	*	---	RESISTOR, fixed: composition; 100,000 ohms ±10%; ½ w; max body dimen 0.468" lg x 0.249" diam JAN type #RC20BF104K.	R–13 and R–6: B+ voltage divider.	3RC20BF104K
R–6	---	*			
R–15	*	---		R–15 and R–12: Plate decoupling, detector—a-f amplifier.	
R–12	---	*			
R–3	*	---	RESISTOR, fixed: compositoin; 220,000 ohms ±10%; ½ w; max body dimen 0.468" lg x 0.249" diam; JAN type RC20BF224K.	R–3 and R–2; Oscillator grid bias.	3RC20BF224K
R–2	---	*			
R–14	*	---		R–14 and R–11: Plate load, detector—a-f amplifier.	
R–11	---	*			
R–8	*	---	RESISTOR, fixed: composition; 470,000 ohms ±10%; ½ w; max body dimen 0.468" lg x 0.249" diam; JAN type RC20BF474K.	Isolation	3RC20BF474K
R–1	*	*	RESISTOR, fixed: composition; 1 meg ±10%; ½ w; max body dimen 0.468" lg x 0.249" diam; JAN type RC20BF105K.	R–1: Grid return, r-f amplifier.	3RC20BF105K
R–9	*	*		R–9: Detector load.	
R–16	*	---		R–16: Grid return, a-f output stage (Batt. operation).	
R–17	---	*		R–17: Grid return, a-f output stage V–6.	
R–11	*	---	RESISTOR, fixed: composition; 3.3 meg ±10%; ½ w; max body dimen 0.468" lg x 0.249" diam; JAN type RC20BF335K.	R–11 and R–7: Diode bias	3RC20BF335K
R–7	---	*		R–19 and R–14: Grid return, r-f amplifier.	
R–19	*	---			
R–14	---	*		R–13: Grid return, V–5	
R–13	---	*		R–31: Isolation.	
R–31	---	*			
R–7	*	---	RESISTOR, fixed: composition; 4.7 meg ±10%; ½ w: max body dimen 0.468" lg x 0.249" diam; JAN type RC20BF475K.	Grid return, detector—a-f amplifier.	3RC20BF475K
R–10	---	*			
O–2	*	*	SPRING: helical extension type; 0.15" diam spring steel; ⅛" OD x ¾" lg overall; approx 33 turns; hook term, hooks single full loop over ctr; Lear part/dwg #53715.	Provides tension for tuning dial.	2Z8877.201
S–2A, B, C, D.	---	*	SWITCH, rotary: 7 pole, 3 position; 2½" lg x 1$^{7}/_{16}$" wd x 1⅞" h overall; shorting type cont; solder lug term; mtg bushing ⅜"–32 x ¼" lg, split shaft ¼" diam x ½" lg; shaft extension adj, split shaft standard knurl RMA #M4–101; Lear part/dwg #62926.	Band selector	3Z9826–61.1
S–5	*	---	SWITCH, rotary: 6 pole, 3 position; 3 sect; 3⅝" lg x 1⅞" wd x 1⅝" h; shorting type cont; solder lug term; bushing ⅜"–32 x ¼" lg, shaft ¼" diam x ¾" lg from mtg surface; shaft straight knurled $^{1}/_{32}$" and sedr slotted ½" d; Oak type #H, #27155–H3.	Band selector	3Z9825–62.211

Reference symbol	Models R-206/PR	Models R-206A/PR	Name of part and description	Function of part	Signal Corps stock No.
S–2	*	---	SWITCH, slide: DPDT; 1⅜″ lg x 1$^{7}/_{32}$″ wd x ⅞″ h overall; shorting type cont; actuating knob $^{9}/_{32}$″ lg x $^{7}/_{32}$″ wd x $^{7}/_{32}$″ h; locking type, normally open; flush mtg, two 0.140″ diam mtg holes on 1⅛″ mtg/c; Oak #78.	S–2 and S–3: BATT. AC–DC switch. S–1: WHIP-LOOP antenna selector.	3Z9835–4.3
S–3	---	*			
S–1		*			
T–11	*	---	TRANSFORMER, AF: plate coupling type; tapped pri, 25,000 ohms impedance and 3000 ohms impedance, 2 secd windings 200 ohms impedance and 3.2 ohms impedance; upright shielded case, silicon steel core; 2½″ lg x 1⅝″ wd x 2″ h overall; ½ w operating level; 7 flexible wire leads from sides; two $^{3}/_{16}$″ diam mtg holes on 2″ mtg/c; Lear part/dwg #53733.	Output load and coupling	2Z9632.473
T–3	---	*			
R–12	*	---	RESISTOR, variable: composition; 1 meg ±20%; ½ w; enclosed metal case 1⅛″ diam x 1.047″ d; round metal shaft ¼″ diam x $^{25}/_{32}$″ lg from mtg surface; log taper; bushing ⅜″–32 x ¼″ lg; DPST switch, 3 amp 125 v; CTS #WR–35.	Sensitivity (VOLUME) control.	3Z7499–1.9
R–5	---	*			
X–1	*	*	SOCKET, tube: octal; 1-piece saddle mtg, two 0.136″ diam mtg holes on 1$^{5}/_{16}$″ mtg/c; round molded bakelite body, 1$^{3}/_{16}$″ diam x $^{9}/_{16}$″ thk excluding term; Cinch #9900.	X–1: Tube socket for r-f amplifier. X–2: Tube socket for converter. X–3: Tube socket for i-f amplifier. X–4: Tube socket for detector-a-f amplifier. X–5: Tube socket for a-f output stage (BATT. operation).	2ZK8678.35
X–2	*	*			
X–3	*	*			
X–4	*	*			
X–5	*	*			
X–6	*	*	SOCKET, tube: 7 cont miniature; 1-piece saddle mtg; two 0.125″ diam mtg holes on ⅞″ mtg/c; cylindrical molded plastic body, 0.800″ min, 0.805″ max diam x 1$^{9}/_{32}$″ lg incl term; JAN type S010M.	X–6: Tube socket for a-f output stage (AC–DC operation). X–7: Tube socket for rectifier V–7.	2Z8677.94
X–7	---	*			
LS–1	*	*	SPEAKER, dynamic: 5″ diam cone; PM field; 2 w normal; voice coil impedance 3.2 ohms at 400 cps; 5″ diam x 2$^{7}/_{16}$″ d overall; Lear part/dwg #53727.	Speaker	6C293–17
T–9	*	---	TRANSFORMER, IF: 455 kc; 1st IF; shielded; approx 1¼″ sq x 2¾″ h; tuned pri and secd; var mica capacitor tuning; 2 #6–32 x ⅜″ lg mtg bolts on 1$^{13}/_{16}$″ ctr; 4 color-coded wire leads, 1 w/grid cap; Lear part #T–501.	Converter—i-f coupling	3C323–140G
T–1	---	*	TRANSFORMER, IF: 455 kc; input; shielded; 1¼″ sq x 2¾″ h overall; double-tuned; mica trimmers; mts w/2 spade bolts on 1$^{3}/_{16}$″ mtg/c; 4 wire leads; Lear part/wdg #53730.	----do----	2Z9641.291
T–10	*	---	TRANSFORMER, IF: 445 kc; 2d IF; shielded: approx; 1¼″ sq x 2¾″ h; tuned pri and secd; var mica capacitor tuning; 2 #6–32 x ⅜″ lg mtg bolts on 1$^{13}/_{16}$″ ctr; 4-color-coded leads; Lear part #T–601.	I-f—detector coupling	3C323–140E

Reference symbol	Models		Name of part and description	Function of part	Signal Corps stock No.
	R-206/PR	R-206A/PR			
T–2		*	TRANSFORMER, IF: 455 kc; output; shielded; 1¼" sq x 2¾" h overall; double tuned; mica trimmers; mts w/2 spade bolts on 1 5/16" mtg/c; 4 wire leads; Lear part-dwg #53729.	do	2Z9641.290
	*				
V–5		*	TUBE, electron: JAN–1A5GT	A-f output tube (BATT. operation).	2J1A5GT
	*		TUBE, electron: JAN–1A7GT	Converter	2J1A7GT
V–2		*			
	*		TUBE, electron: JAN–1H5GT	Detector—a-f amplifier	2J1H5GT
V–4		*			
	*		TUBE, electron: JAN–1N5GT	V–1: R-f amplifier	2J1N5GT
V–1		*			
V–3				V–3: I-f amplifier	
V–7		*	TUBE, electron: JAN–35W4	Rectifier (AC—DC operation).	2J35W4
V–6		*	TUBE, electron: RMA #50B5	A-f output tube (AC—DC tion).	2J50B5
	*		TUBE, electron: JAN–117N7GT	Rectifier—a-f output tube	2J117N7GT

RESISTOR COLOR CODES



COLOR	SIGNIFICANT FIGURE	MULTIPLYING VALUE	TOLERANCE (%)
BLACK	0	1	± —
BROWN	1	10	± 1
RED	2	100	± 2
ORANGE	3	1,000	± 3
YELLOW	4	10,000	± 4
GREEN	5	100,000	± 5
BLUE	6	1,000,000	± 6
VIOLET	7	10,000,000	± 7
GRAY	8	100,000,000	± 8
WHITE	9	1,000,000,000	± 9
GOLD	—	0.1	± 5
SILVER	—	0.01	± 10
NO COLOR	—	—	± 20

NOTES

* INSULATED FIXED COMPOSITION RESISTORS WITH AXIAL LEADS ARE DESIGNATED BY A NATURAL TAN BACKGROUND COLOR. NON-INSULATED FIXED COMPOSITION RESISTORS WITH AXIAL LEADS ARE DESIGNATED BY A BLACK BACKGROUND.

/ RESISTORS WITH AXIAL LEADS ARE INSULATED. RESISTORS WITH RADIAL LEADS ARE NON-INSULATED.

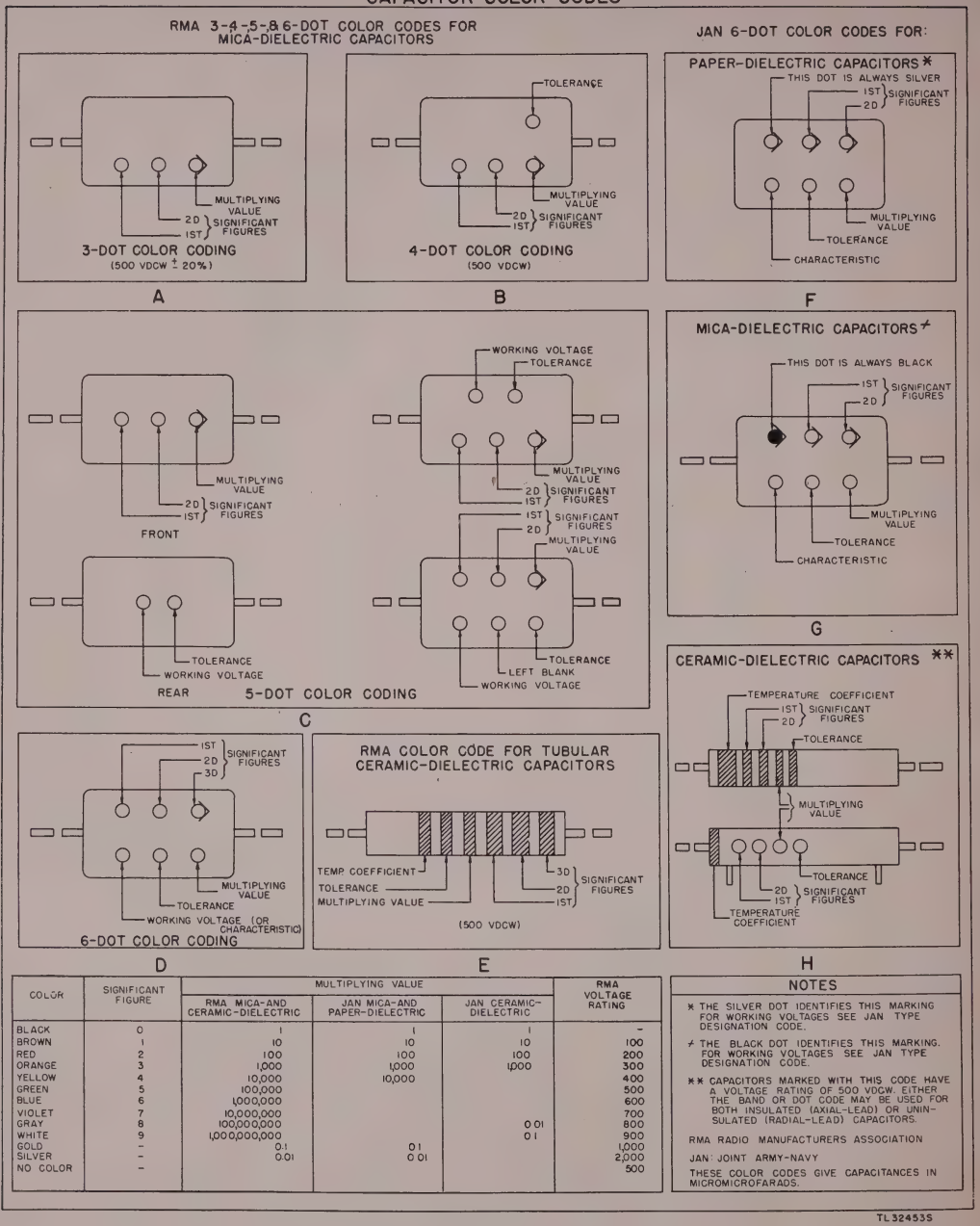
RMA: RADIO MANUFACTURERS ASSOCIATION

JAN: JOINT ARMY-NAVY

THESE COLOR CODES GIVE ALL RESISTANCE VALUES IN OHMS.

TL32454S

Figure 21. Resistor color codes.



COLOR	SIGNIFICANT FIGURE	MULTIPLYING VALUE			RMA VOLTAGE RATING
		RMA MICA-AND CERAMIC-DIELECTRIC	JAN MICA-AND PAPER-DIELECTRIC	JAN CERAMIC-DIELECTRIC	
BLACK	0	1	1	1	–
BROWN	1	10	10	10	100
RED	2	100	100	100	200
ORANGE	3	1,000	1,000	1,000	300
YELLOW	4	10,000	10,000		400
GREEN	5	100,000			500
BLUE	6	1,000,000			600
VIOLET	7	10,000,000			700
GRAY	8	100,000,000		0.01	800
WHITE	9	1,000,000,000		0.1	900
GOLD	–	0.1	0.1		1,000
SILVER	–	0.01	0.01		2,000
NO COLOR	–				500

NOTES

* THE SILVER DOT IDENTIFIES THIS MARKING FOR WORKING VOLTAGES SEE JAN TYPE DESIGNATION CODE.

✓ THE BLACK DOT IDENTIFIES THIS MARKING FOR WORKING VOLTAGES SEE JAN TYPE DESIGNATION CODE.

** CAPACITORS MARKED WITH THIS CODE HAVE A VOLTAGE RATING OF 500 VDCW. EITHER THE BAND OR DOT CODE MAY BE USED FOR BOTH INSULATED (AXIAL-LEAD) OR UNINSULATED (RADIAL-LEAD) CAPACITORS.

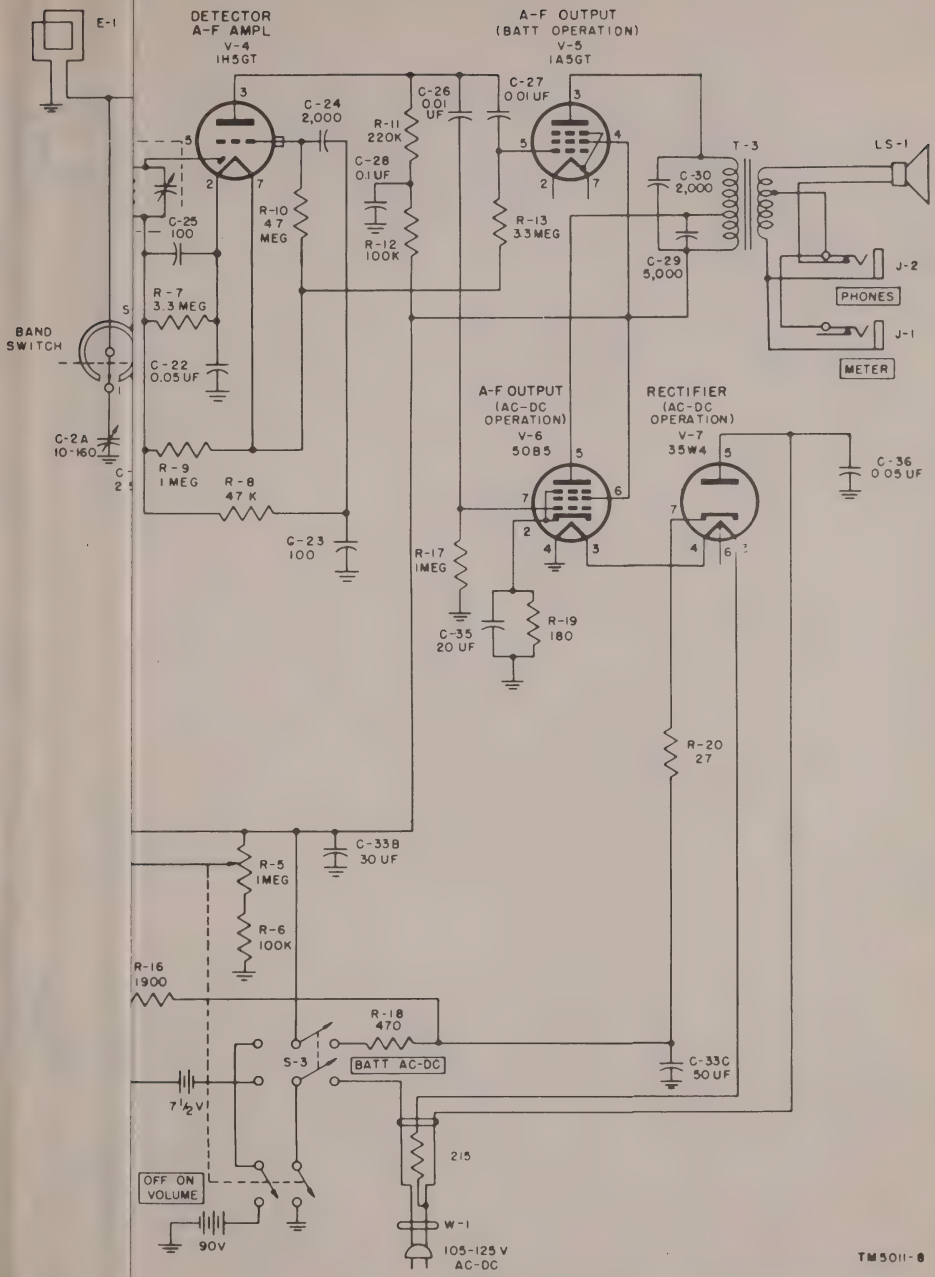
RMA RADIO MANUFACTURERS ASSOCIATION

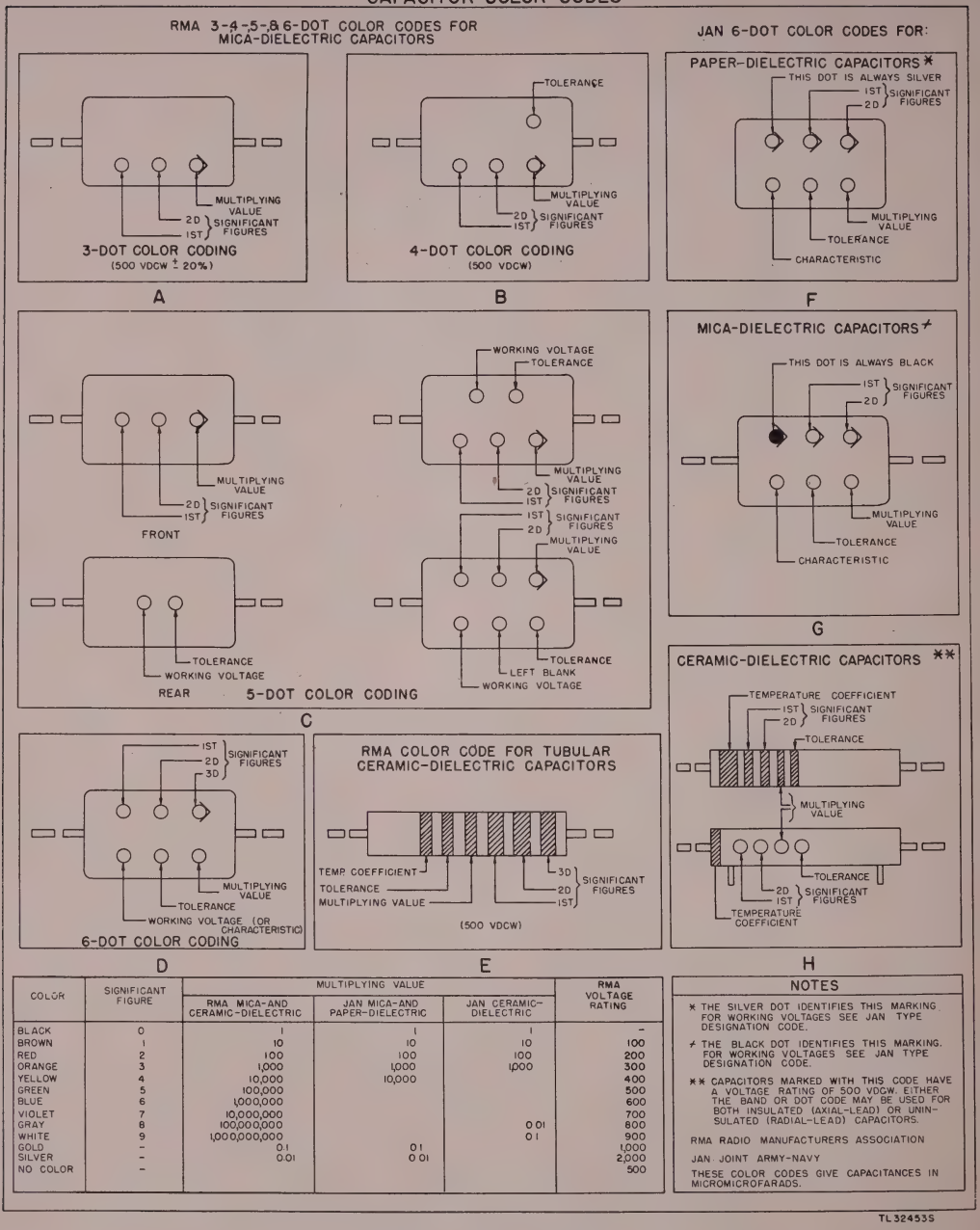
JAN: JOINT ARMY-NAVY

THESE COLOR CODES GIVE CAPACITANCES IN MICROMICROFARADS.

TL32453S

Figure 22. Capacitor color codes.


E-1
DETECTOR
A-F AMPL
V-4
1H5GT
A-F OUTPUT
(BATT OPERATION)
V-5
1A5GT
C-24
2,000
C-26
0.01
UF
C-27
0.01 UF
R-11
220K
C-28
0.1 UF
R-12
100K
R-13
3.3 MEG
T-3
LS-1
C-30
2,000
C-29
5,000
J-2
PHONES
J-1
METER
C-25
100
R-10
47
MEG
R-7
3.3 MEG
BAND
SWITCH
C-22
0.05 UF
C-2A
10-160
R-9
1 MEG
R-8
47 K
C-23
100
A-F OUTPUT
(AC-DC
OPERATION)
V-6
50B5
RECTIFIER
(AC-DC
OPERATION)
V-7
35W4
C-36
0.05 UF
R-17
1MEG
C-35
20 UF
R-19
180
R-20
27
C-33B
30 UF
R-5
1MEG
R-6
100K
R-16
1900
R-18
470
S-3
BATT AC-DC
C-33C
50 UF
7½ V
OFF ON
VOLUME
90V
215
W-1
105-125 V
AC-DC
TM 5011-8



COLOR	SIGNIFICANT FIGURE	MULTIPLYING VALUE			RMA VOLTAGE RATING
		RMA MICA-AND CERAMIC-DIELECTRIC	JAN MICA-AND PAPER-DIELECTRIC	JAN CERAMIC-DIELECTRIC	
BLACK	0	1	1	1	-
BROWN	1	10	10	10	100
RED	2	100	100	100	200
ORANGE	3	1,000	1,000	1,000	300
YELLOW	4	10,000	10,000		400
GREEN	5	100,000			500
BLUE	6	1,000,000			600
VIOLET	7	10,000,000			700
GRAY	8	100,000,000		0.01	800
WHITE	9	1,000,000,000		0.1	900
GOLD	-	0.1	0.1		1,000
SILVER	-	0.01	0.01		2,000
NO COLOR	-				500

NOTES

* THE SILVER DOT IDENTIFIES THIS MARKING FOR WORKING VOLTAGES SEE JAN TYPE DESIGNATION CODE.

≠ THE BLACK DOT IDENTIFIES THIS MARKING. FOR WORKING VOLTAGES SEE JAN TYPE DESIGNATION CODE.

** CAPACITORS MARKED WITH THIS CODE HAVE A VOLTAGE RATING OF 500 VDCW. EITHER THE BAND OR DOT CODE MAY BE USED FOR BOTH INSULATED (AXIAL-LEAD) OR UNINSULATED (RADIAL-LEAD) CAPACITORS.

RMA RADIO MANUFACTURERS ASSOCIATION

JAN JOINT ARMY-NAVY

THESE COLOR CODES GIVE CAPACITANCES IN MICROMICROFARADS.

TL 32453S

Figure 22. Capacitor color codes.

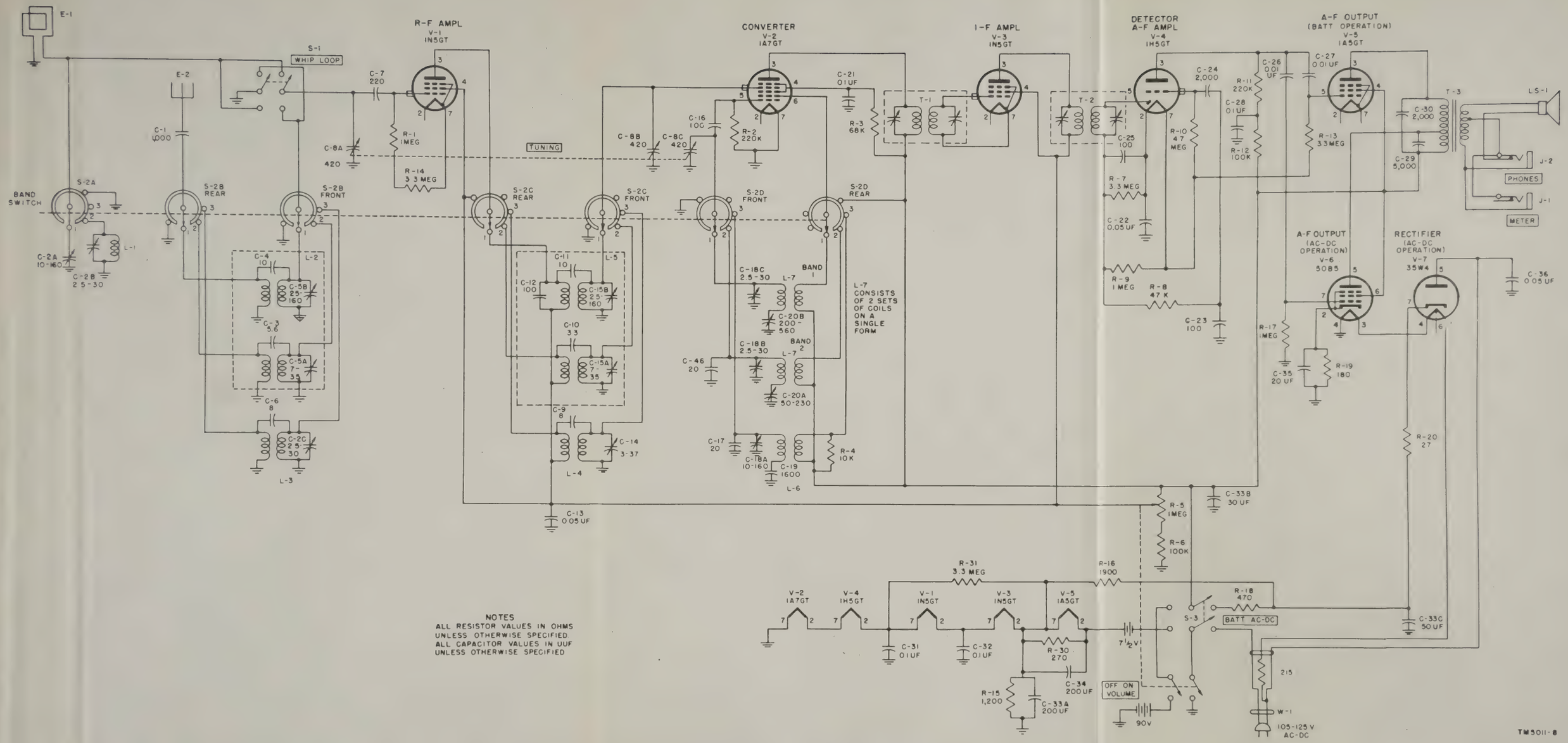
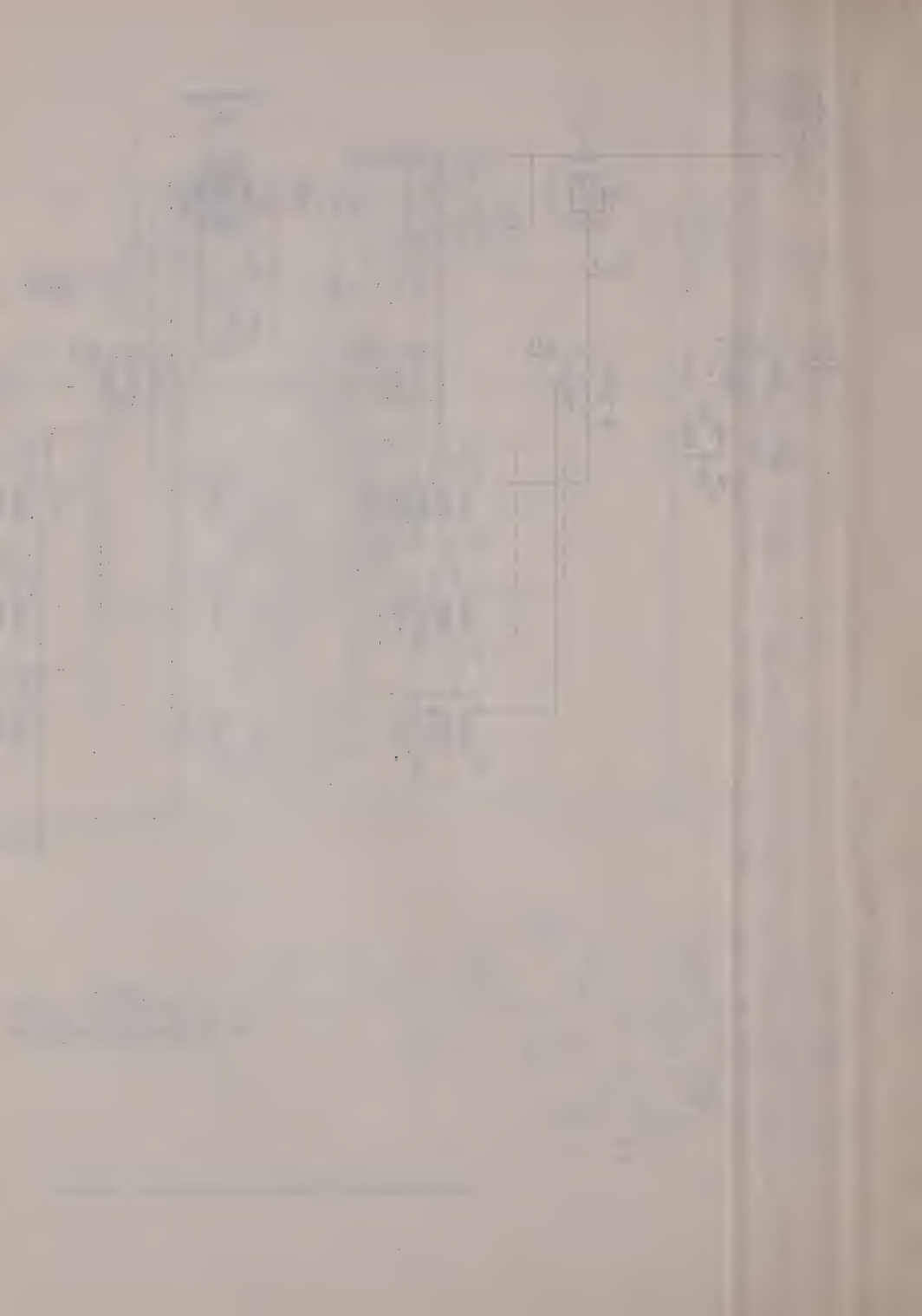
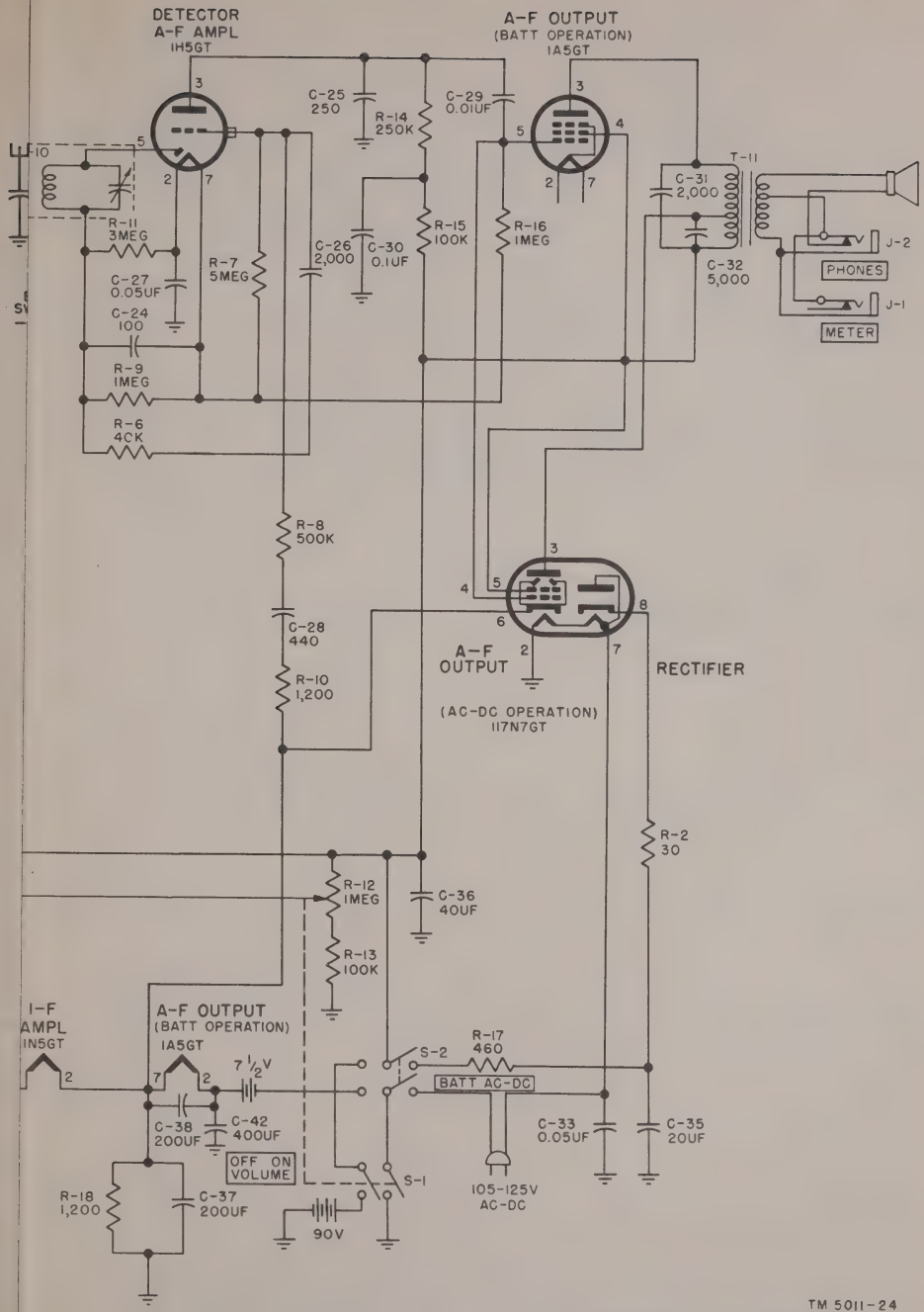
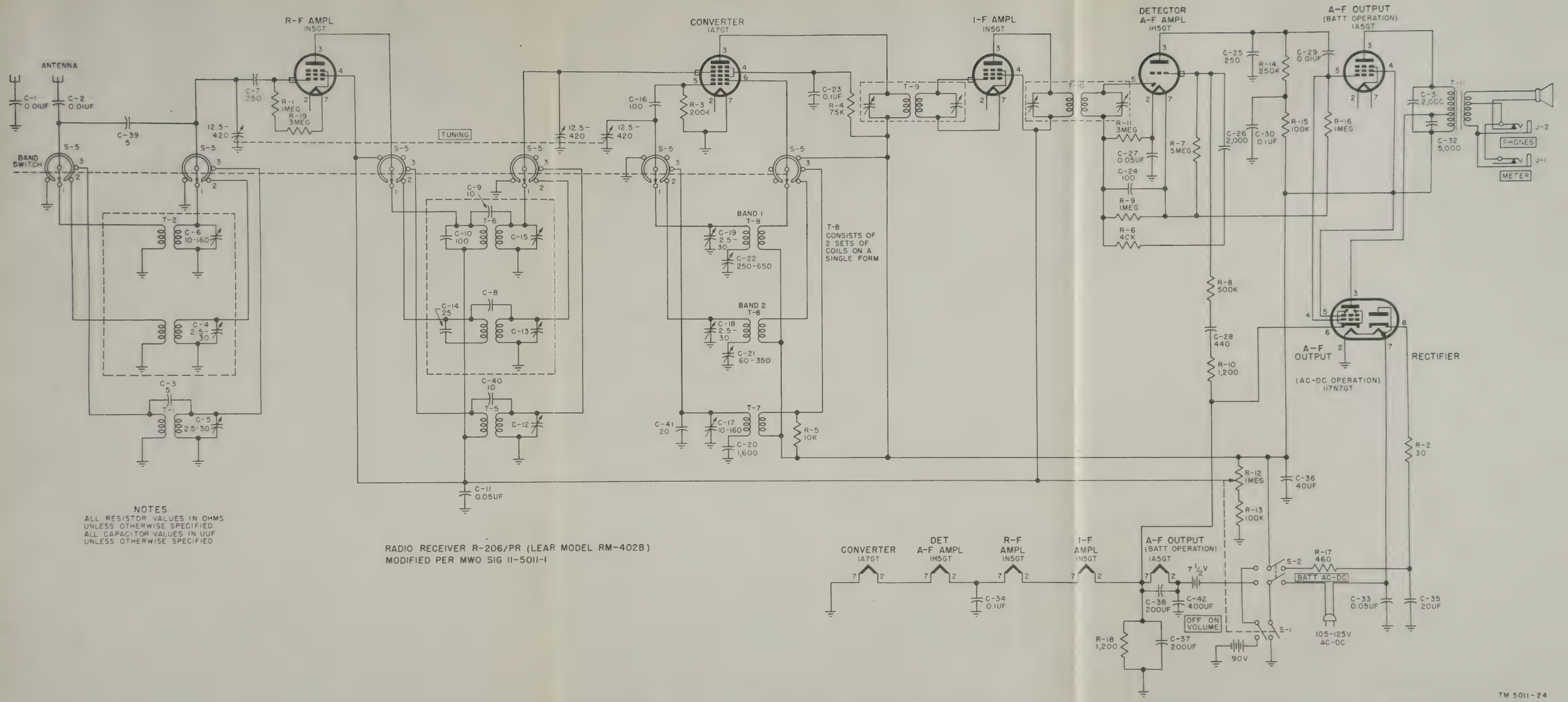


Figure 23. Radio Receiver R–206A/PR, schematic diagram.




DETECTOR
A-F AMPL
1H5GT
A-F OUTPUT
(BATT OPERATION)
1A5GT
C-25
250
R-14
250K
C-29
0.01UF
T-11
C-31
2,000
C-32
5,000
J-2
PHONES
J-1
METER
R-11
3MEG
C-27
0.05UF
C-24
100
R-9
1MEG
R-6
40K
R-7
5MEG
C-26
2,000
C-30
0.1UF
R-15
100K
R-16
1MEG
R-8
500K
C-28
440
R-10
1,200
A-F
OUTPUT
(AC-DC OPERATION)
117N7GT
RECTIFIER
R-2
30
R-12
1MEG
R-13
100K
C-36
40UF
I-F
AMPL
1N5GT
A-F OUTPUT
(BATT OPERATION)
1A5GT
7 1/2 V
S-2
R-17
460
BATT AC-DC
C-38
200UF
C-42
400UF
OFF ON
VOLUME
S-1
R-18
1,200
C-37
200UF
90V
105-125V
AC-DC
C-33
0.05UF
C-35
20UF

TM 5011-24

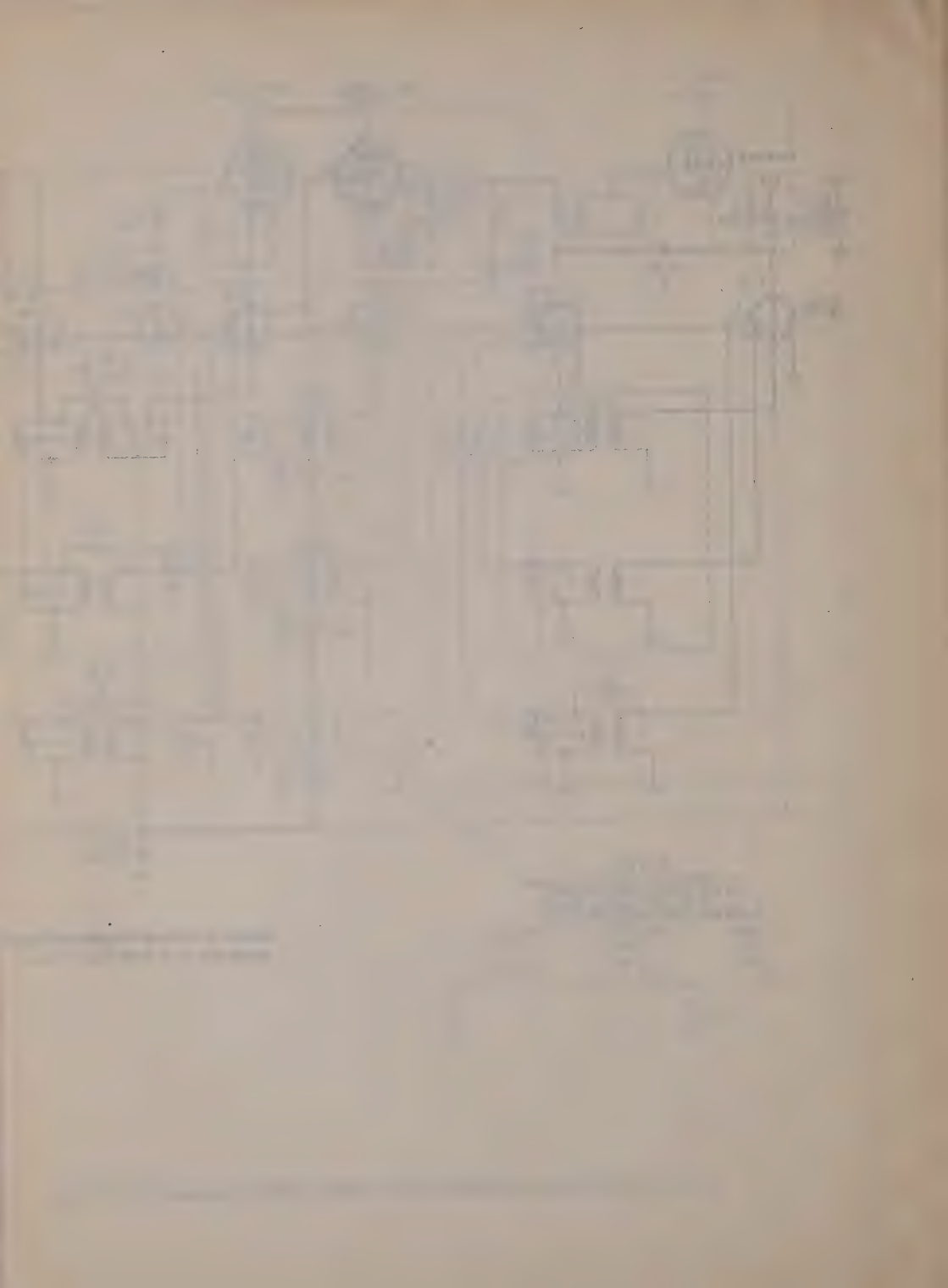


NOTES.
ALL RESISTOR VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.
ALL CAPACITOR VALUES IN UUF UNLESS OTHERWISE SPECIFIED.

RADIO RECEIVER R-206/PR (LEAR MODEL RM-402B)
MODIFIED PER MWO SIG 11-5011-1

Figure 24. Radio Receiver R-206/PR, schematic diagram (modified as per MWO SIG 11-5011-1).

TM 5011-24



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